Final Report of
Brownfield Cleanup Grant Implementation
Former Sanitary Laundry Property, Knoxville, TN
S&ME Project No. 4143-17-016
EPA Brownfields Cooperative Agreement
No. BF-00D47816-0

PREPARED FOR:

City of Knoxville Office of Redevelopment
400 Main Street, Suite 655
Knoxville, Tennessee 37902

PREPARED BY:

S&ME, Inc.
6515 Nightingale Lane
Knoxville, TN 37909

September 16, 2019

September 16, 2019

City of Knoxville Office of Redevelopment
400 Main Street, Suite 655
Knoxville, Tennessee 37902

Attention: Ms. Anne Wallace

Reference: **Final Report of Brownfield Cleanup Grant Implementation**
Former Sanitary Laundry Property
625 North Broadway
Knoxville, Tennessee
EPA Brownfields Cooperative Agreement No. BF-00D47816-0
S&ME Project No. 4143-17-016

Dear Anne:

S&ME, Inc. (S&ME) has completed the implementation of the USEPA Brownfield Cleanup Grant, with matching City of Knoxville funding, for the Former Sanitary Laundry site located at 625 North Broadway in Knoxville, Tennessee. The Brownfield Cleanup Services were performed to further assess the nature and extent of surface and subsurface contamination associated with the past use of the subject site, provide an updated Analysis of Brownfield Cleanup Alternatives, and perform site cleanup activities, including partial installation of a vapor mitigation system. This report summarizes the activities performed during the grant implementation and provides considerations for the future redevelopment of the site.

S&ME appreciates this opportunity to be of service to you. Please call if you have questions concerning this report or our services.

Sincerely,

S&ME, Inc.

Elizabeth Porter, PG, PMP
Project Manager

James R. Bruce, PG, CHMM
Quality Assurance Officer

CC: Olga Perry, USEPA
Justin Fisher, TDEC Knoxville
Paula Middlebrooks, TDEC

Table of Contents

Appendices

Executive Summary

S&ME Inc. (S&ME) has completed implementation of the Environmental Protection Agency (EPA) Brownfield Cleanup Grant for the former Sanitary Laundry site located at 625 North Broadway in Knoxville, Tennessee. The property is occupied by a vacant, 30,000 square-foot structure (15,000 square feet on two levels) used for dry cleaning operations between 1926 and 1993. Services were performed under the 2016 EPA Brownfields Cleanup Grant under EPA Brownfields Cooperative Agreement No. BF-00D47816-0 and matching City of Knoxville (City) funding.

Soil and groundwater investigations previously conducted at the subject property have identified media (i.e., soil groundwater, sub-slab/soil gas, and indoor air) contaminated with dry cleaning compounds, solvents, and petroleum products. The Tennessee Department of Environment and Conservation (TDEC) Division of Remediation (DOR) has been involved with this site in a regulatory capacity for many years. In an effort to support the City's redevelopment efforts, and to secure an approach to site redevelopment that is consistent with applicable regulations, TDEC has executed a Brownfield Voluntary Agreement (BVA) (Site No. 47-545) for the subject property. TDEC and the City have agreed that the BVA is to be made a condition of sale of the property.

Constituent concentrations detected in sub-slab gas and indoor air samples collected during implementation of previous site assessments were compared to the May 2018 EPA Regional Screening Level (RSLs) for industrial air (Target Carcinogenic Risk (TCR) = $1x10^{-6}$ and a Target Hazard Quotient for Non-carcinogens (THQ) = 0.1)). Where detected sub-slab constituents exceeded the corresponding target soil gas concentrations, they also were evaluated for vapor intrusion (VI) hazard and VI Carcinogenic Risk using the Office of Solid Waste and Emergency Response (OSWER) Vapor Intrusion Screening Level (VISL) Calculator (Version 3.5, June 2017), with a TCR = $1x10^{-6}$ and a THQ = 0.1 under a commercial land use scenario, adjusted using a factor of 0.03 to account for attenuation. The residential land use scenario was not evaluated; based on current and historic contaminant levels, the VISL findings under a commercial scenario, the BVA, TDEC input and current City plans. The site is anticipated to be limited to commercial uses. The results of VISL screening using the sub-slab soil gas results under a commercial scenario identified a VI Carcinogenic Risk in excess of the TCR (1×10^{-6}) for chloroform, 1,2-dichloroethane, 1,1,1,2-tetrachloroethane, PCE, 1,1,2-trichloroethane, TCE, and vinyl chloride. A VI Hazard was identified in excess of the THQ (0.1) for 1,2-dichloroethane, TCE, PCE, 1,1,2-trichloroethane and vinyl chloride.

Using the EPA Brownfield Cleanup Grant funds, several cleanup related tasks were accomplished at the site, including the removal and disposal of asbestos-containing material, chemical and solid waste material in the basement, and special waste generated during the cleanup activities and the roof replacement performed under a separate contract with the City. A large portion of the cleanup funds were used for the evaluation, design and partial installation of a sub-slab vapor mitigation system. Designs and quotes were obtained from two vendors, and the selected vendor (Clean Vapor LLC) installed 16 risers and system sub-slab depressurization suction points in accordance with their design. Since cleanup funds were limited, and because the building is currently un-occupied and therefore more prone to vandalism and/or theft, partial installation of the system was performed, eliminating the above-ground equipment until redevelopment plans have been finalized and the vapor mitigation infrastructure can be configured to accommodate future specific building improvement designs.

S&ME understands the City envisions commercial or retail redevelopment of the subject property. As part of the redevelopment effort, the BVA will need to be finalized, and a Land Use Restriction and Site Management Plan will be required. Lead-based paint remains in the building and should also be addressed, and the VI potential should continue to be addressed during redevelopment planning, with an evaluation of the partially-installed vapor mitigation system and completion of the system installation. Coordination with DOR should also be performed during redevelopment.

1.0 Site Background Information

1.1 Site Characteristics

The former Sanitary Laundry property consists of one parcel containing approximately 0.3 acre, owned by the City of Knoxville (City), and located at 625 North Broadway in Knoxville, Tennessee (Figures 1 and 2, Appendix I). The property center is located at 35.975358° N latitude and -83.924359° W longitude. The property is identified on the Knox County Tax Assessor's Tax Map as Tax Map 94D, Group P, Parcel 13. The general topographic slope in the vicinity of the site is down to the northwest. The property is occupied by a currently vacant, 30,000 square-foot structure (15,000 square feet on two levels) used for dry cleaning operations between 1926 and 1993.

1.2 Project Purpose

The City envisions the redevelopment of the site for retail or commercial use. Prior assessment activities identified recognized environmental conditions (RECs) related to previous use of the site and identified impacted environmental media through sampling and laboratory analysis.

The Brownfield Cleanup Grant Implementation performed by S&ME included a range of services intended to address data gaps from the previous site assessment activities, and plan and implement the selected site cleanup activities as discussed in the S&ME Inc. (S&ME) April 3, 2019 Analysis of Brownfield Cleanup Alternatives (ABCA) Revision 1.

1.3 Site Assessment History

S&ME previously generated the following reports to document site assessment activities intended to evaluate potential impacts associated with the former dry cleaning operations:

- *S&ME Report of Phase I Environmental Site Assessment*, *Former Sanitary Laundry and Dry Cleaning Property*, July 31, 2013
- *S&ME Report of Phase II Environmental Site Assessment, Former Sanitary Laundry Property*, September 12, 2014
- *S&ME Report of Limited Asbestos and Lead-Based Paint Survey, 625 North Broadway Former Sanitary Laundry Facility*, October 22, 2014
- *S&ME Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Site,* September 10, 2015
- *S&ME Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Property,* February 18, 2019

- *S&ME Analysis of Brownfield Cleanup Alternatives Rev. 1, Former Sanitary Laundry Property,* April 3, 2019

Numerous additional reports and site-related documents are available in the extensive Tennessee Department of Environment and Conservation (TDEC) regulatory files. It is worthwhile to note that the reports referenced above and present in the TDEC files include both the parcel located at 625 North Broadway as well as the parcel located at 750-760 Stone Street, located west and adjacent to the subject property, and part of the former Sanitary Laundry operation. The parcel at 750-760 Stone Street contained the boiler house and a loading and vehicle maintenance building. The Stone Street parcel is currently owned by others and was excluded from the cleanup activities.

As summarized in the referenced reports and previous documentation available in TDEC files, one dry cleaning solvent and two gasoline underground storage tanks (UST) utilized by the dry cleaner were located on the property or on the Stone Street parcel behind the building, which was also part of the former Sanitary Laundry operation. The gasoline USTs were permanently closed by removal in 1993. The dry cleaning UST was reportedly emptied in 1994 but remains on the property, behind the former Sanitary Laundry building. TDEC Division of Remediation (DOR) personnel (Ms. Erin Sutton and Mr. Dan Hawkins) have indicated that the dry cleaning solvent tank was filled with concrete sometime in the 1990's. TDEC records reviewed previously by S&ME confirm that in 1994, the tank that previously stored dry cleaning solvent was emptied and subsequently filled with concrete.

Soil and groundwater investigations have identified soil and groundwater contaminated with dry cleaning compounds, solvents, and petroleum products. The Phase I ESA previously performed for the site by S&ME documented evidence of recognized environmental conditions (RECs) relative to former uses of the subject property. The RECs documented in the Phase I ESA include:

- The subject property operated as a dry cleaner from 1926 until 1993.
- The subject property was identified on multiple regulatory databases.
- Dry cleaning compounds and solvents at concentrations that exceed primary drinking water Maximum Contaminant Levels (MCLs) have been detected in groundwater.
- Two gasoline USTs and one heating oil aboveground storage tank (AST) have been located on or behind the subject property in the past (on the 750-760 Stone Street parcel).
- Evidence of one dry cleaning solvent UST was observed on the subject property. The contents of the UST were reportedly removed in 1994 but no soil testing was documented at that time.
- Numerous 55 gallon drums of dry cleaning fluids and oil were observed and removed from the Sanitary Laundry property in 1999.
- Two groundwater monitoring wells are located in the courtyard area west of the North Broadway building.
- One in-ground hydraulic lift was observed in the garage building behind the subject property (on the 750-760 Stone Street parcel).
- The subject property was placed on the State Superfund list in 1994.

In 1994, the subject property was added to the List of Inactive Hazardous Substance Sites by action of the Tennessee Solid Waste Disposal Control Board. The subject property was identified as Site No. 47-545, Sanitary Laundry and Dry Cleaners. A Notice of a Hazardous Substance Site was filed with the Knox County Register's Office in 1997. An Imminent, Substantial Danger Memorandum was issued by the TDEC Commissioner in 1999,

due to the presence of multiple 55-gallon drums of hazardous substances on-site. TDEC initiated emergency removal actions in 1994, and again in 1999, addressing the USTs and two barrels of dry cleaning fluid in 1994, and implementing an emergency removal of the drums in 1999.

Based on the Phase I ESA findings, in 2014 S&ME conducted a Phase II ESA on behalf of the City to determine the nature and extent of subsurface contamination resulting from past use of the property. The Phase II ESA consisted of the collection and laboratory analysis of 34 passive soil vapor modules, subsurface soil samples, groundwater samples, soil gas samples and ambient air samples from the former Sanitary Laundry property, which included the subject property and the west adjacent parcel formerly owned by Sanitary Laundry. A Geoprobe® rig was used to obtain subsurface soil samples for field and laboratory analyses. Groundwater samples were collected from two existing monitoring wells and from six piezometers installed during the Phase II ESA sampling.

The analysis of soil samples revealed arsenic concentrations in 14 samples that exceed the EPA May 2014 Residential Soil Regional Screening Level (RSL), and 13 samples that exceed the Industrial Soil RSL for arsenic. However, the reported arsenic concentrations did not vary significantly with depth or location and are therefore interpreted as naturally-occurring background. Of the volatile organic compounds (VOC) and polynuclear aromatic hydrocarbon (PAH) compounds detected in soil samples, only tetrachloroethylene (PCE) and benzo(a)pyrene exceed respective Residential Soil RSLs. None of the reported VOC or PAH concentrations exceed Industrial Soil RSLs.

Concentrations of petroleum hydrocarbons (extractable petroleum hydrocarbons (EPH), and total petroleum hydrocarbons (TPH)) that exceed the TDEC Division of Solid Waste Management (DSWM) clean fill criteria of 100 milligrams per kilogram (mg/kg) were reported in soil samples collected from within the Sanitary Laundry building, the former auto repair building (west adjacent parcel) and the former UST locations (west adjacent parcel).

Arsenic concentrations detected in groundwater samples exceed the corresponding arsenic Tapwater RSL. Lead concentrations detected in each groundwater sample exceed the EPA drinking water MCL. Concentrations of benzene and the chlorinated solvents; PCE, trichloroethylene (TCE), cis-1,2-dichloroethene and vinyl chloride also exceed the EPA May 2014 Tapwater RSLs and MCLs were detected in groundwater samples. Also notable was the detection of 1,2-dichlorobenzene, ethylbenzene, naphthalene, n-propylbenzene, the trimethylbenzene isomers, and xylenes in concentrations that exceed the EPA May 2014 Tapwater RSLs.

The eight soil gas samples collected during the 2014 Phase II ESA reported concentrations of benzene, ethylbenzene, carbon tetrachloride, chloroform, PCE, TCE, 1,1-dichloroethane, 1,1-dichloroethene, and vinyl chloride that exceed the respective EPA May 2014 Residential and/or Industrial Air RSLs. It is notable that PCE concentrations exceeded the Industrial Air RSL by up to three orders of magnitude in sub-slab samples. PCE and TCE concentrations were reported in the soil gas below the building with maximum concentrations of 68,000 micrograms per cubic meter (µg/m^3) and 10,000 µg/m^3, respectively.

Ambient air sampling resulted in concentrations of benzene, carbon tetrachloride, chloroform, chloromethane, ethylbenzene, PCE and TCE that exceed Residential and Industrial Air RSLs. The highest chloromethane, ethylbenzene, PCE and TCE concentrations were reported for air samples collected in the former main Sanitary Laundry building, which occupies the subject property. A maximum concentration of PCE in ambient air was detected at 46 µg/m^3, and TCE was detected at 6.4 µg/m^3. Ambient air samples collected by TDEC on April 1,

2015 in the adjoining buildings tested positive for solvents, but at concentrations that TDEC indicated were "significantly below our risk based remedial goals."

As documented in the S&ME *Report of Limited Asbestos and Lead-Based Paint Survey, 625 North Broadway Former Sanitary Laundry Facility*, dated October 22, 2014, both asbestos and lead-based paint (LBP) were encountered in the building during the assessment.

The TDEC DOR has been involved with this site in a regulatory capacity for many years. In an effort to support the City's redevelopment efforts, and to secure an approach to site redevelopment that is consistent with applicable regulations, TDEC has executed a Brownfield Voluntary Agreement (BVA) (Site No. 47-545) for the subject property. TDEC and the City have agreed that the BVA is to be made a condition of sale of the property. The BVA established for the site requires a vapor mitigation system to be incorporated for any building construction or renovation on the property to address those chemical constituents identified in previous assessment activities. The goal of the soil vapor mitigation system is to break the exposure pathway for vapor migration.

The City recently replaced the roof on the former Sanitary Laundry property. Based on the historic significance of the site, and the investment in improving the existing structure, redevelopment using existing foundations is the preferred option for site redevelopment, rather than demolishing the existing structure and foundations. In order to support this method of site redevelopment, a vapor mitigation system is warranted to mitigate those chemical constituents identified in previous assessment activities that exceed relevant regulatory comparison criteria. The building currently has some broken windows, as well as holes in the floor that allow air movement between the basement and the first floor. In addition, there is currently not a heating or cooling system operating in the building, and a design for the redevelopment of the structure has not yet been proposed. Because of the current conditions within this vacant building, TDEC recommended that ambient air samples not be collected at the time of the sampling events, as the results would not reflect typical conditions if the building was occupied. Therefore, to gather current site information to support the vapor mitigation system design, S&ME updated the sub-slab soil gas evaluation, and added flux chamber samples to provide supplemental data for design purposes. Specifically, S&ME collected 12 soil gas samples (including one field duplicate) and six flux chamber samples from the site to update the data for VOCs at the site. In addition, S&ME utilized two subcontractors, Clean Vapor LLC (Clean Vapor) and Radon 1 to perform sub-slab communication testing and prepare system designs.

Constituent concentrations detected in the 2018 sub-slab gas and flux chamber samples were compared to the May 2018 EPA RSLs for industrial and residential air (Target Carcinogenic Risk (TCR) = $1x10^{-6}$ and a Target Hazard Quotient for Non-carcinogens (THQ) = 0.1)). Where detected sub-slab constituents exceeded the corresponding target soil gas concentrations, they also were evaluated for vapor intrusion (VI) hazard and VI Carcinogenic Risk using the Office of Solid Waste and Emergency Response (OSWER) Vapor Intrusion Screening Level (VISL) Calculator (Version 3.5, June 2017), with a TCR = $1x10^{-6}$ and a THQ = 0.1 under a commercial land use scenario, adjusted using a factor of 0.03 to account for attenuation. The residential land use scenario was not evaluated, because based on current and historic contaminant levels, the VISL findings under a commercial scenario, the BVA, TDEC input and current City plans, the site is anticipated to be limited to commercial uses.

Each of the sub-slab gas samples (SS-1 through SS-12 and one field duplicate) was analyzed for VOCs by EPA Method Toxic Organics-15 (TO-15). Nineteen analytes exceeded both Residential and Industrial RSLs in at least one sample, and PCE exceeded the industrial RSL in each of the 12 samples and the duplicate, with a maximum detected concentration of 303,000 µg/m^3 in sample sub-slab sample SS-4.

The analytical results from the flux chamber sampling reported concentrations of 12 analytes which exceeded the Residential Air RSLs and eight analytes which exceeded the industrial RSLs. The flux chamber samples generally demonstrated lower VOC concentrations than the nearby sub-slab samples, as would be expected. There was generally no strong correlation between the flux chamber samples collected over cracks within the concrete vs. the flux chamber samples collected over concrete with no observable cracks.

The results of VISL screening using the sub-slab soil gas results under a commercial scenario identified a VI Carcinogenic Risk in excess of the TCR (1×10^{-6}) for chloroform, 1,2-dichloroethane, 1,1,1,2-tetrachloroethane, PCE, 1,1,2-trichloroethane, TCE, and vinyl chloride. A VI Hazard was identified in excess of the THQ (0.1) for 1,2-dichloroethane, TCE, PCE, 1,1,2-trichloroethane and vinyl chloride.

Based on the findings of the S&ME Phase II assessment activities, S&ME provided the analytical results to Clean Vapor and Radon 1, firms specializing in the design and installation of vapor mitigation systems. Both firms performed additional diagnostics testing and provided a mitigation plan design based on their building and subsurface diagnostics.

From June 11 to June 12, 2018, sub-slab pressure field extension testing was performed by Clean Vapor to support their design of a vapor intrusion mitigation system (VIMS) intended to induce a negative pressure field under the slab of the building, so that sub-slab vapors will be unlikely to migrate upward into the building. A second estimate was requested by TDEC, and on November 7, 2018, Radon 1 preformed their onsite sub-slab pressure field extension testing used to support their design. The Clean Vapor and Radon 1 designs are provided in Appendix II.

As part of the cleanup planning effort, S&ME also collected a sample of the black granular material previously stored in and around several 55-gallon steel drums located in the boiler room in the basement, for disposal characterization purposes. The sample was collected on April 16, 2018, and submitted to ESC Laboratory in Mt. Juliet, Tennessee for analysis of target compound list/target analyte list and toxicity characteristic leaching procedure analytical parameters, along with EPH. Metals and low-level benzo(b)fluoranthrene and fluoranthene were detected, and the results were used to obtain a quote for disposal of this material. The analytical laboratory report is provided in the April 3, 2019 ABCA.

2.0 Draft Brownfield Voluntary Agreement

As mentioned previously, the TDEC DOR has been involved with this site for many years. In an effort to support the City's redevelopment efforts, and to confirm that site redevelopment is performed in accordance with applicable regulations, TDEC previously prepared the draft BVA (Site No. 47-545). TDEC and the City have agreed that the BVA is to be made a condition of sale of the property. A copy of the draft BVA is included in Appendix III and should be reviewed for an understanding of the TDEC requirements for the subject property redevelopment. Some of the terms and conditions pertaining to property redevelopment are summarized herein:

- Prior to any part of the Property being used for a residence, domicile, daycare, school, or church, the Grantor, its successors, and/or assigns must notify TDEC DOR and must demonstrate to the satisfaction of TDEC DOR that any such proposed use listed above will not pose a danger to public health, safety, or the environment.

- Prior to the removal of soil at the Property, the Grantor, its successors, and/or assigns must notify TDEC DOR and must demonstrate to the satisfaction of TDEC DOR that any such proposed soil removal will not pose a danger to public health, safety, or the environment.
- The Grantor, its successors, and/or assigns must notify TDEC DOR prior to any invasive activity on the Property including soil borings or potable groundwater wells. The Grantor, its successors, and/or assigns must demonstrate to the satisfaction of TDEC DOR, through sampling and analysis approved by TDEC DOR, that any invasive activity will not pose a danger to public health, safety, or the environment.
- Any new building construction on the property shall incorporate a vapor mitigation system designed to prevent subsurface vapor phase contamination from migrating into the structure at concentrations greater than applicable regulatory comparison criteria. Using the Brownfield Cleanup Grant funds, two vapor mitigation system plans were developed by TDEC-approved remediation contractors (Clean Vapor and Radon 1) and provided to the City, TDEC DOR and EPA for review. Partial installation of the selected system is discussed in Section 4.5. Once site redevelopment plans have been developed, and after installation of the remainder of the system, the TDEC-approved contractor shall submit a written report to the TDEC DOR documenting how the system was installed, any deviations from the TDEC-reviewed plan, as built drawings, and an Operation and Maintenance Plan identifying continued care and operation and maintenance activities to be conducted to ensure the venting system is effective in preventing subsurface vapor phase contamination from migrating into the structure at concentrations greater than applicable screening levels.
- The Grantor, its successors, and/or assigns shall be responsible for continued care, operation, and maintenance of the remedy. The Grantor, its successors, and/or assigns shall notify TDEC DOR in writing if the integrity of the remedy is compromised and take any steps necessary to eliminate the threat or potential threat to public health, safety, or the environment posed by the hazardous substance(s).
- The Voluntary Party agrees that criteria required in Tennessee Code Annotated (TCA) 68-212-206(d) shall be used in determining containment and cleanup actions, including monitoring and maintenance options to be followed under this Agreement.
- The Voluntary Party agrees to prepare a Soil Management Plan (SMP) for DOR approval prior to the commencement of construction activities. The SMP will include, but not be limited to, procedures for temporary staging or containerization and characterization of any excavated materials, handling to ensure that any offsite disposal of impacted media meets all State and Federal requirements, and, if needed, installation of a barrier or engineered cap. A Health and Safety Plan shall be submitted to the DOR for review and comment.
- The Voluntary Party agrees to perform the work set forth in the SMP and the Voluntary Party shall submit a written report of its findings to the DOR within 90 days of completion of such work. The report shall include, but not be limited to, as-built drawings, details of any capping, and waste manifests for offsite disposal. The report shall also identify any areas where soil remains at the subject property that must be managed in the future to protect human health, safety, or the environment and requirements for future soil management and maintenance of any covers or caps.
- The Voluntary Party agrees that it will file any land use restriction identified by the DOR as necessary for the safe use of the property in accordance with TCA 68-212-225.

3.0 Evaluation of Cleanup Alternatives

The City and TDEC DOR previously provided input on the proposed cleanup alternatives for the subject property, assuming that the site will be redeveloped for retail or commercial purposes. As discussed in Section 4, in preparation for redevelopment, the asbestos has been removed, but LBP remains within the building. Funds from the Cleanup Grant were not used for LBP removal, instead they were used for supplemental remedial investigation sampling, asbestos abatement, waste disposal and sub-slab vapor mitigation system infrastructure installation. The LBP issue should be addressed as part of any proposed redevelopment plan.

In the 2015 ABCA, three cleanup alternatives were considered, including:

- No action,
- Redevelopment using existing foundations,
- Removal of some or all of the existing foundations, followed by construction of a new structure.

The April 3, 2019 revised ABCA prepared by S&ME discussed these alternatives and presented recommendations for addressing environmental concerns identified at the site, as summarized below. A full copy of the ABCA is currently available on the City's website:

http://www.knoxvilletn.gov/UserFiles/Servers/Server_109478/File/Redevelopment/CleanupGrants/2019%20Sanitary%20ABCA%204%203.pdf

3.1 No Action

The "no action" alternative is not considered viable because the subject property is currently in a state of disrepair and therefore has the potential to negatively impact surrounding property values. The current redevelopment climate in Knoxville and the previous assessments using funds from the EPA Brownfields Assessment and Planning Grant have generated interest in the area. The City is interested in leveraging this interest into an opportunity to advance the redevelopment of the subject site, and they have invested significant funds into replacing the roof on the building to support future redevelopment. Previous assessments have documented VOCs in breathing air which could pose a threat to human health once the site is occupied, further demonstrating that "no action" is not a viable option.

3.2 Redevelopment Using Existing Foundations

A cleanup approach that would accommodate redevelopment using existing foundations would be the preferred option if the proposed use for the subject property would support this approach. Demolition as warranted, and removal of generated demolition debris in accordance with local, State and Federal regulations would be required. One advantage of this approach would be to limit subsurface disturbance to utility trenches or other limited areas where excavation would be needed to support the redevelopment design. A SMP would be required to characterize and address potentially impacted material that may be encountered during these limited excavation activities. The SMP would be developed once preliminary plans for the site are available and the specific redevelopment activities can be anticipated.

The proposed site redevelopment must address the potential for subsurface vapors to migrate to indoor ambient air thru the matrix and penetrations of the existing concrete slab. As part of the site re-design for the proposed use, completion of the soil vapor mitigation system would be required to protect building occupants.

The 2015 ABCA considered a sub-slab depressurization system for mitigation purposes. The Clean Vapor and Radon 1 mitigation designs incorporate this approach, and a copy of their plan designs completed in July 2018 and November 2018, respectively, are included in Appendix II. To prepare their designs, both vendors evaluated the sub-slab connectivity (i.e., permeability) of the sub-base aggregate/soil and other interstices present beneath the slab. Information regarding this connectivity was used by each vendor to determine the number and positioning of sub-slab depressurization points, venting infrastructure and fans, and other specifications for the VIMS. Based on discussions with TDEC and evaluation of contractor qualifications and submittals prior to installation, S&ME and the City selected the Clean Vapor system for the Sanitary Laundry site.

Based upon limitations associated with available cleanup funds, and because the building is currently un-occupied and therefore more prone to vandalism and/or theft, S&ME recommended partial installation of the system, eliminating the proposed mechanical and electrical equipment components until redevelopment plans for the existing structure have been finalized and building improvements are underway. Because the first floor slab may warrant improvements based on the redevelopment plans, the Clean Vapor system installation did not include overhead piping runs. These were to have been attached to the basement ceiling but would have potentially been impacted or removed during building renovations. As part of this remedial approach, S&ME also included disposal of soil generated during installation of the sub-slab depressurization pits at an approved facility in accordance with regulatory requirements.

Partial installation of the depressurization system infrastructure lessens the burden on the next property owner, but also commits the building owner to complete installation of the electrical and mechanical system components required to an activate the sub-slab depressurization system, potentially limiting their option to consider alternative remedial approaches. The future building owner will need to evaluate the system relative to the proposed building renovations, and determine if additional remedial efforts are warranted, beyond activation of the partially installed sub-slab depressurization system infrastructure.

In addition to the SMP and vapor mitigation system design, this cleanup alternative also warrants a land-use restriction to document the VIMS details, establish that groundwater usage from the subject site is prohibited, and to document the established protocol for monitoring and maintenance of the VIMS.

3.3 Removal of Some or All of the Existing Foundations

Removal of some or all of the existing foundations, followed by construction of a new structure, was considered in the 2015 ABCA. Assuming that some impacted soils and/or groundwater could potentially remain beneath the building following the removal of existing foundations, this cleanup alternative would require the same measures presented in Section 3.2, including development of a SMP, a VIMS, and filing of a land-use restriction document for the site. In addition, this alternative would require that the excavated foundations and impacted sub-slab materials be characterized and handled in accordance with local, State and Federal regulations, and in accordance with the SMP. The estimated cost for this approach was not provided in 2015, as it depends on factors such as the extent of foundation demolition proposed, the width and depth of existing foundations, and the level of impacts encountered in the underlying soils. For comparison purposes, the 2015 ABCA stated that if the underlying

material is classified as special waste that can be disposed at a Subtitle D Landfill, fees for excavation, transportation and disposal might be on the order of $75/ton. If some or all of this material is classified as hazardous waste, excavation, transportation and disposal fees could increase to approximately $350/ton.

Redevelopment under this scenario would likely incur additional site characterization and regulatory negotiation fees, as it would be in the developer's best interest to obtain a thorough understanding of the existing foundation and soil conditions in the vicinity of the proposed excavation areas to the extent practicable before excavation is initiated. Because the City has completed the replacement of the roof on the building, and because there is an interest in maintaining as much of the character of the original structure as practicable, this option is likely not a priority for redevelopment considerations at this time.

4.0 Environmental Cleanup Activities

Using the EPA Brownfield Cleanup Grant funds, several cleanup related tasks were accomplished at the site, as documented below:

4.1 Removal and Disposal of Asbestos-Containing Material

During the initial walk-through following receipt of the Cleanup Grant funds, S&ME observed that sections of overhead piping had been cut and removed, possibly for salvage by vagrants taking shelter in the vacant building. Asbestos wrap from the former piping systems was observed discarded on the ground beneath the former piping runs. In order to make the site safe for future cleanup activities, removal of the asbestos-containing material (ACM) was required. Between December 18, 2017 and December 29, 2017, NEO Corporation (NEO) abated approximately 895 linear feet (LF) of asbestos-containing thermal system insulation (TSI), 1,665 square feet (SF) of floor tile/mastic, 800 SF of ceiling cork board, and 400 SF of boiler wrap at the site. NEO Corporation utilized negative pressure, wet glove bag methods, high-efficiency particulate air (HEPA) vacuum, and a prompt clean up. NEO performed a final inspection of the jobsite upon completion, and fine cleaning was performed after the asbestos abatement. All waste was double-bagged and disposed of in an approved landfill for asbestos-containing materials. All asbestos was removed according to local, state, and federal regulations. The NEO Asbestos Abatement Final Submittal dated January 8, 2018 is included in Appendix IV.

4.2 Removal and Disposal of Waste Material in the Basement

In January 2018, crews from the City removed and disposed of 21.26 tons (estimated 42,520 pounds) of solid waste previously stored in the basement of the Sanitary Laundry building. The material was removed by the City Solid Waste/Household Hazardous Waste Departments and processed through their waste disposal program. The material included pallets of paint, antifreeze, sealants, etc., as well as various building materials stockpiled in the basement.

4.3 Removal and Disposal of Special Waste Generated During Roof Renovation

During the roof renovation performed by others, the roofing contractor removed portions of concrete slab comprising the basement floor in two locations and one location in the pavement outside of the building to accommodate proposed installation of the roof drains. Upon learning of this activity, the City instructed the contractor to stop sub-slab excavations and contacted S&ME, and an alternative approach for the roof drain

installations was established. This activity was handled outside of the Brownfield Cleanup Grant, with the exception of the drum sampling performed on January 30, 2018 to characterize the soil excavated by the roofing contractor and placed into three 55-gallon steel drums by S&ME to manage the material. The soil samples detected VOCs consistent with the previous site characterization activities. The three drums were removed for proper disposal as special waste by Domermuth Environmental Services, located Knoxville, Tennessee. Copies of the non-hazardous disposal manifest are located in Appendix V.

4.4 Removal and Disposal of Drums of Black Granular Material

A total of six drums containing black granular material were formerly located in the basement, and these were removed for disposal on August 14, 2019. This material was previously sampled in April 2018, and the analytical results were presented in the April 3, 2019 S&ME ABCA. As mentioned above, metals and low-level benzo(b)fluoranthrene and fluoranthene were detected. A portion of the surfaces of the drums containing the material exhibited evidence of corrosion and deterioration due to rust which prevented the drums from being placed in overpack drums for disposal. S&ME subcontracted with Environmental Remediation Consultants, Inc. (ERC) to remove the material from the rusted drums and dispose of the granular material and the rusted drums. ERC classified the material as unused absorbents. The granular material was removed from the rusted drums using a drum vacuum. A total of eight new drums were utilized to containerize the granular material. The drums were transported under manifest as non-hazardous material to a permitted disposal facility. The manifests and photographs of the drums, material, and clean-up are included in Appendix V.

4.5 Partial Installation of Vapor Mitigation System

During the week of August 12, 2019, Clean Vapor installed 16 risers and suction points in accordance with their design for the vapor mitigation system. Representative photographs of the installation are included in Appendix II. As mentioned previously, since cleanup funds were limited, and because the building is currently un-occupied and therefore more prone to vandalism and/or theft, partial installation of the system was performed, eliminating the above-ground equipment until redevelopment plans have been finalized and building improvements are underway. The first-floor slab may warrant improvements based on the redevelopment plans, and therefore the Clean Vapor system installation did not include overhead piping runs. These were to have been attached to the basement ceiling but would have potentially been impacted or removed during building renovations.

The soil and concrete debris generated during the system installation was placed into two 55-gallon drums and sampled for disposal purposes. One composite sample from each drum was submitted to Pace Analytical in Mt. Juliet, Tennessee for analysis of VOCs (Method 8260B), semi-volatile organic compounds (SVOCs) (Method 8270C) and EPH (Method EPH). Analytical results were consistent with previous samples collected from the site, except for an elevated EPH concentration in one of the samples (7,340 mg/kg). Our field observations did not indicate unusual staining or odor from this material, and we considered the possibility that there was cross-contamination from equipment or staining on the basement floor while the material was transferred to the drum. S&ME is also aware that early 1900's architects/builders often used tar-like barriers with chemical compounds high in PAHs for moisture control beneath concrete slabs. In any case, the drummed soil was transported and disposed by Domermuth as special waste, in accordance with the procedures used for previous drums of soil generated during the roof renovation (Section 4.3).

5.0 Conclusions

S&ME understands the City envisions commercial or retail redevelopment of the subject property. The information documented herein and summarized below should be provided to developers interested in the site.

5.1 Brownfield Agreement, Land Use Restriction and Soil Management Plan

A draft BVA has been prepared for the site by TDEC and the City. As part of the site redevelopment plan, the BVA should be finalized, and an appropriate accompanying Land Use Restriction and SMP should be developed. These documents will require DOR approval prior to the commencement of construction activities. The proposed redevelopment should be described in the SMP, and the potential for contact with impacted media should be addressed. The SMP should include, but not be limited to, procedures for temporary staging or containerization and characterization of any excavated materials, handling to ensure that any offsite disposal of impacted media meets all State and Federal requirements, and, if needed, installation of a barrier or engineered cap. A Health and Safety Plan shall also be submitted to the DOR for review and comment prior to construction.

5.2 Lead-Based Paint

As documented in the S&ME *Report of Limited Asbestos and Lead-Based Paint Survey, 625 North Broadway Former Sanitary Laundry Facility*, dated October 22, 2014, both asbestos and LBP were encountered in the building during the assessment. In preparation for redevelopment, the asbestos has been removed using a portion of the Cleanup Grant funds, but LBP remains within the building. The LBP issue should be addressed as part of any proposed redevelopment plan.

5.3 Vapor Intrusion

As documented herein and in the supporting previous site reports, the results of VISL screening using the sub-slab soil gas results under a commercial scenario identified a VI Carcinogenic Risk in excess of the TCR (1×10^{-6}) for chloroform, 1,2-dichloroethane, 1,1,1,2-tetrachloroethane, PCE, 1,1,2-trichloroethane, TCE, and vinyl chloride. A VI Hazard was identified in excess of the THQ (0.1) for 1,2-dichloroethane, TCE, PCE, 1,1,2-trichloroethane and vinyl chloride.

Using a portion of the cleanup funds, Clean Vapor has installed 16 risers and suction points in accordance with their design for the vapor mitigation system. Since the building is currently un-occupied and therefore more prone to vandalism and/or theft, the above-ground mechanical and electrical equipment components were not installed.

The VI potential should continue to be addressed during site redevelopment planning, with an evaluation of the partially-installed vapor mitigation system and completion of the system to address the VI potential under the proposed redevelopment scenario. Coordination with DOR should also be performed as the VI issue is addressed.

6.0 References

1. S&ME *Report of Phase I Environmental Site Assessment, Former Sanitary Laundry and Dry Cleaning Property*, July 31, 2013
2. S&ME *Report of Phase II Environmental Site Assessment, Former Sanitary Laundry Property*, September 12, 2014
3. S&ME *Report of Limited Asbestos and Lead-Based Paint Survey, 625 North Broadway Former Sanitary Laundry Facility*, October 22, 2014
4. S&ME *Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Site*, September 10, 2015
5. S&ME *Quality Assurance Project Plan for Sanitary Laundry and McClung Warehouses Cleanup Grants, Knoxville, Tennessee*, August 28, 2017
6. S&ME *Site Specific Quality Assurance Project Plan Former Sanitary Laundry Property, Knoxville, Tennessee*, February 14, 2018
7. S&ME *Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Property,* September 14, 2018
8. S&ME *Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Property,* February 18, 2019
9. S&ME *Analysis of Brownfield Cleanup Alternatives, Former Sanitary Laundry Property Rev.1*, April 3, 2019
10. USEPA *Regional Screening Level (RSL) Summary Table* (TR=1.0E-06, HQ=0.1), May 2018.

Appendices

Appendix I – Figures

Figure 1: Aerial Site Vicinity Map
Figure 2: Sample Location Map

REFERENCE:
GIS BASE LAYERS WERE OBTAINED FROM GOOGLE. THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. ALL FEATURE LOCATIONS DISPLAYED ARE APPROXIMATED. THEY ARE NOT BASED ON CIVIL SURVEY INFORMATION, UNLESS STATED OTHERWISE.

Drawing Path: R:_GIS PROJECTS\2017_Projects\4143-17-016 Sanitary Laundry\FIGURE 1_SITE LOCATIONS MAP.mxd plotted by jrowe 06-20-2018

AERIAL SITE VICINITY MAP

FORMER SANITARY LAUNDRY PROPERTY
625 N. BROADWAY
KNOXVILLE, TENNESSEE

SCALE:	FIGURE NO.
1 " = 400 '	1
DATE: 6-20-18	
PROJECT NUMBER: 4143-17-016	

Drawing Path: R:_GIS PROJECTS\2017_Projects\4143-17-016 Sanitary Laundry\FIG2 SANITARY LAUNDRY .mxd plotted by jrowe 06-20-2018

SAMPLE LOCATION MAP

FORMER SANITARY LAUNDRY PROPERTY
625 N. BROADWAY
KNOXVILLE, TENNESSEE

SCALE: 1 " = 50 '

DATE: 6-20-18

PROJECT NUMBER: 4143-17-016

FIGURE NO. 2

Appendix II – Vapor Mitigation System Designs and Photographs

VAPOR INTRUSION MITIGATION PLAN DESIGN
for:
Former Sanitary Laundry
625 N. Broadway
Knoxville, Tennessee

Prepared for:

Liz Porter, P.G., PMP
Senior Project Manager/Vice President
6515 Nightingale Lane
Knoxville, TN 37909

Prepared by:

Thomas E. Hatton
CEO – Project Director
Clean Vapor, LLC
148 Route 94
P.O. Box 688
Blairstown, NJ 07825

NRPP ID 104705

July 13, 2018

Table of Contents

Front of Building to be Mitigated

1 Introduction

1.1 Background

Clean Vapor, LLC (Clean Vapor) was retained by S&ME to conduct a building investigation, diagnostic testing, and prepare a vapor intrusion mitigation system (VIMS) design for the Former Sanitary Laundry at 625 N. Broadway located in Knoxville, Tennessee. The building area of concern measures approximately 15,000 square feet. From June 11 to June 12, 2018, sub slab pressure field extension testing was conducted.

The proposed VIMS has been designed to create a negative pressure field (relative to typical building pressures at the time of diagnostic testing and under reasonably anticipated future re-development scenarios) under the slab of the building, in the areas identified in Figure 1.2, so that sub slab vapors will be unlikely to migrate upward into the building. Clean Vapor's design consists of specifications and drawings that provide details for construction of a Sub Slab Depressurization System (SSDS). If installed, operated and maintained per specifications, the SSDS will be able to maintain negative sub slab pressures under reasonably anticipated conditions and prevent soil vapors from entering the building. The goal of the system is to create a sub slab negative pressure field of -0.004 to -0.008 inches of water column ("w.c.) with a minimum vacuum field of -0.004"w.c. at the outer extent of the negative pressure field during adverse conditions.

The design presented herein is based on complete depressurization of the entire 15,000 square foot surface. The building is a historic two-story brick structure that is classified as a city landmark and currently part of an environmental cleanup grant. The ground floor level is slab on grade. The second floor is structural concrete and is supported by concrete columns and beams. Concurrent with the cleanup grant activities, the roof has been renovated by the city.

1.2 Building Slabs

The area of focus consists of three (3) slab areas, the main slab, the ramp area, and the lower slab where the dry-cleaning vessels are located. Diagnostic testing determined that two (2) soil depressurization systems would mitigate the targeted slab areas.

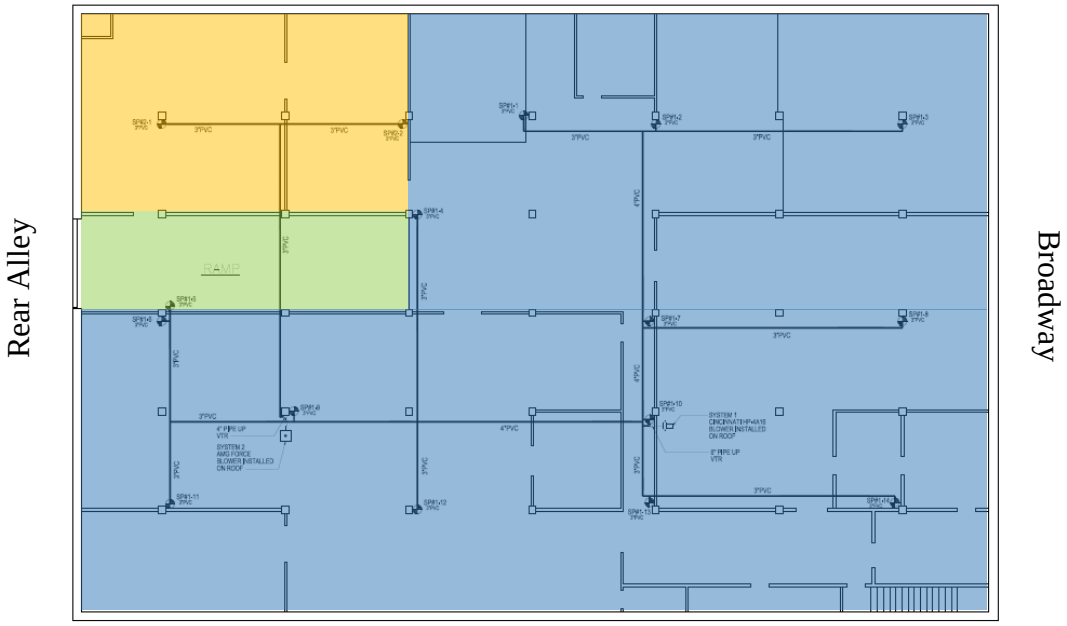


Figure 1.2 Subject Building

2 Diagnostics

2.1 Diagnostic Procedures

In accordance with the accepted design proposal and plan for diagnostics dated April 26, 2018, a building investigation and diagnostic testing were performed between June 11 and June 12, 2018. Four (4) 2 5/8-inch diagnostic suction hole(s) were drilled throughout the building. A calibrated shop vacuum was used to apply vacuum to the sub slab material to simulate vacuum fields. Smaller test holes were drilled on an x and y axis throughout the areas within the suction holes' radii of influence. The motor speed of the vacuum was varied to develop a performance curve that would enable us to project the radius of influence and airflow characteristics of different blowers.

On the day that sub slab pressure field extension testing occurred, indoor to outdoor pressure differential measurements were not taken due to the open condition of the building. This process would normally determine if the pressure differentials would be a significant contributing factor that would influence the operational range of blowers selected. The weather on June 12, 2018, the day the sub slab vacuum field testing occurred, was mostly cloudy, 77º F, winds 6 mph (SW), barometer 30.01″ Hg, and humidity 75 percent. Both the open condition of the building due to broken windows and similar indoor to outdoor temperatures are factors that contributed to the near neutral pressure condition that existed between the underlying soil and the interior of the building at the time of pressure field extension testing. Based on an assumed 70° indoor temperature after

renovation and historic seasonal outdoor temperatures, reserve capacity was built into the blowers selected.

Static vacuum and airflow measurements were conducted at the suction holes. A micro-manometer was used to measure pressure differentials at the remote test holes. A vane anemometer was used to measure airflow that was yielded from the sub slab. The acquired data has been interpolated to make reasonable assumptions to predict pressure field extension and airflow. Baseline pressure differential measurements were collected to establish building pressures relative to the sub slab material. The pressure differentials, which are the driving force that induces vapor intrusion, are always greater during the heating season as compared to the summer and can be as much as one order of magnitude greater than what was measured during the time of our investigation. For example, the sub slab baseline pressure differentials measured at the time of our investigation were in the thousands to ten thousandths inch of water column range. During the heating season it is anticipated that these pressure differentials would be in the hundredths to thousandths inch of water column range. These differences in pressure is a common occurrence and is accounted for in the blowers selected.

The results of vacuum field extension testing are shown in the Diagnostic Data Section of this report. Pictures of the vacuum field extension testing being performed can also be seen in the Pictures section and relevant points from testing are shown on a sheet in the attached drawings.

THIS SPACE INTENTIONALLY LEFT BLANK

2.2 Diagnostic Data

Below is the test data from the four (4) areas where sub slab pressure differentials were recorded. The values below indicate that the baseline sub slab pressure is positive and poses a vapor intrusion risk. The locations at which these measurements were made can be found on the Diagnostic Test Hole Sheet 1. All distances are in feet and vacuum measurements in inches of water column.

2.2.1. Test Suction Point #1

Vacuum Applied ("wc):		Baseline	21	11	5
Airflow (cfm):		-	76	53	33
Test Hole #	**Distance (ft.)**				
V1	1	0.0004	-10.31	-5.7	-3.08
V2	5	0.0004	-0.2437	-0.128	-0.0564
1	10	0.0003	-0.4550	-0.2440	-0.1143
2	20	0.0005	-0.0009	-0.0005	N.C.
3	30	0.0004	-0.0006	0.0012	N.C.
4	36	0.0005	-0.0001	0.0050	N.C.
5	10	0.0004	-1.0990	-0.4890	-0.2250
6	20	0.0002	-0.2090	-0.0914	-0.0332
7	30	0.0005	-0.0191	-0.0120	-0.0050
8	40	-0.0015	-0.0012	-0.0027	-0.0023
9	50	-0.0006	-0.0005	-0.0080	-0.0012
10	10	0.0007	-1.0060	-0.5470	-0.2650
11	20	0.0005	-0.2730	-0.1341	-0.0622
12	30	0.0006	-0.2190	-0.1065	-0.0485
13	40	0.0008	-0.0502	-0.0180	-0.0093
14	50	0.0002	-0.0062	-0.0027	-0.0012
15	10	0.0011	-1.0430	-0.0559	-0.0253
16	20	0.0005	-0.0376	-0.0202	-0.0098
17	30	0.0008	-0.0172	-0.0091	-0.0041
18	40	0.0007	-0.0123	-0.0057	-0.0020
19	50	0.0006	-0.0107	-0.0043	-0.0027

2.2.2. Test Suction Point #2

Vacuum Applied ("wc):	Baseline	32	16	8
Airflow (cfm):	-	24	20	10

Test Hole #	Distance (ft.)				
V3	1	0.0002	-24.17	-11.72	-6.06
V4	5	0.013	-5.03	-3.31	-2.05
13	8	0.0008	-3.9900	-1.5730	-0.9160
12	18	0.0006	-0.3120	-0.1787	-0.0958
11	28	0.0005	-0.0872	-0.0495	-0.0258
10	38	0.0007	-0.0225	-0.0120	-0.0061
20	10	0.0004	-0.3510	-0.1962	-0.1036
21	20	0.0004	-0.0773	-0.0376	-0.0194
22	30	0.0006	-0.0169	-0.0087	-0.0046
23	40	0.0003	-0.0062	-0.0025	-0.0009
24	50	0.0003	-0.0017	-0.0006	0.0001
25	10	0.0006	-0.0776	-0.0306	-0.0162
26	10	0.0015	-1.4360	-0.8625	-0.3310
27	20	0.0022	-0.0931	-0.0592	-0.0331
28	30	0.0013	-0.0087	-0.0030	-0.0040
29	40	0.0005	-0.0010	-0.0005	0.0001
30	50	0.0002	0.0004	0.0003	0.0002

2.2.3. Test Suction Point #3

Vacuum Applied ("wc):	Baseline	8	6	4
Airflow (cfm):	-	117	102	74

Test Hole #	Distance (ft.)				
V5	1	0.0006	-2.62	-2.09	-1.50
V6	5	0.0005	-0.97	-0.79	-0.59
31	10	0.0011	-0.6411	-0.5301	-0.3890
32	10	0.0001	-0.5482	-0.4401	-0.3280
33	20	0.0011	-0.1428	-0.1314	-0.0999
34	30	0.0011	0.0004	0.0001	0.0001
35	24	0.0007	-0.3738	-0.1580	-0.1857
36	33	0.0014	-0.0120	-0.0105	-0.0078
37	10	0.0007	-0.8540	-0.6872	-0.5112
38	17	0.0004	-0.7512	-0.6041	-0.4557
39	24	-0.0004	-0.3076	-0.2502	-0.1776
40	10	0.0001	-0.4635	-0.3843	-0.2782
41	17	-0.0008	-0.1319	-0.1153	-0.0836

2.2.4. Test Suction Point #4

Vacuum Applied ("wc):	Baseline	39	20	10
Airflow (cfm):	-	21	20	15

Test Hole #	Distance (ft.)				
V7	1	0.0005	-4.62	-2.66	-1.56
V8	5	0.0004	-2.12	-1.23	-0.72
42	7	0.0001	-1.2660	-0.7383	-0.4759
43	17	-0.0001	-0.5508	-0.3388	-0.2106
44	24	0.0001	-0.3821	-0.2325	-0.1429
45	33	0.0001	-0.1555	-0.094	-0.0584
46	13	0.0006	-0.3787	-0.2595	-0.1395
47	23	-0.0016	-0.2503	-0.1493	-0.0933
48	10	0.0006	-1.0284	-0.5965	-0.3601
49	20	0.0007	0.0008	0.002	0.0007
50	10	0.0003	-0.4103	-0.2443	-0.1662
51	20	0.0017	-0.0038	-0.0024	-0.0012
52	30	0.0005	-0.0002	-0.0011	0.0004
53	40	0.0027	-0.0006	-0.0013	0.0004
54	30	0.0011	-0.0126	-0.0098	-0.0057
55	24	0.0001	-0.0126	-0.0071	-0.0031
56	24	-0.0004	-0.1640	-0.1008	-0.0601
57	38	0.0002	-0.0029	-0.0012	-0.0008
58	47	0.0001	-0.0030	-0.0011	-0.0001

2.3 Interpretation of Diagnostics

Vacuum fields were determined by evaluating the results of the negative pressure field testing. The overall vacuum field extension testing provided data that could be used to develop a model capable of projecting a negative pressure field that will prevent the upward migration of soil gases into the occupied space.

Analysis of the diagnostic data revealed varying permeability in the fill material which is beneath the individual slabs. When vacuum was applied, these soils measured different vacuum field extensions in each section of the building.

It should be noted that if any portion of the floor is cut and opened during the fit out for the installation of sub grade utilities, such as waste lines or grease traps, that those areas shall be back filled with crushed stone. Under no circumstances shall sub surface utilities be backfilled with compacted or lower permeable fill material.

2.4 Blower Selection and Suction Point Locations

Blowers and suction points have been selected and specified based on the volume of air yield, static pressure readings, and measured vacuum field extension recorded during the diagnostic

testing. The design objective is to create a negative pressure field of -0.004 to -0.008"w.c. with a minimum vacuum field of -0.004"w.c at the outer extent of the negative pressure field during adverse pressure conditions. Pressure field projections are adjusted to accommodate anticipated field installation conditions. For example, when removing one cubic foot of soil under the slab, the static pressure can drop 20% and the volume of air increase subject to the limitations of the soil and blower. The radius of the negative pressure field beneath the slab may also increase. Since variability in soils and permeability exist beneath the slab, the projected radius is not based on a pure mathematical extrapolation but a total approach that includes the aforementioned conditions. An examination of the soil matrix, sub slab permeability mapping data, and experience factors are all considered when developing these projections. The graph and table located in Appendix B, Equipment Cut Sheets, depicts the blower curve for the fans to be installed at the site.

3 System Design and Installation

3.1 System Layout

There will be two (2) mitigation systems installed. The table below displays the targeted applied vacuum and projected soil airflow yields to meet minimum pressure field requirements.

System #	Fan Model	Applied Vacuum ("w.c.)	Projected Airflow (cfm)	# of Suction Points	Building Section
1	Cincinnati Fan HP-4A16	12	310	14	Upper Slab
2	Force Blower	3.5	110	2	Lower Slab

3.2 Suction Holes

A total of sixteen (16) suction points will be installed. See Drawing Sheet 3 for the locations of suction points, mitigation piping and blower locations. To enhance the vacuum field distribution and limit any disruption to building use, the suction points will be located near existing walls and on structural columns. The specific location of the suction points shall be agreed upon by Clean Vapor and the building owner's representative prior to installation. When drilling suction points, the procedures listed in the General Installation section shall be followed to minimize damaging any sub slab utilities. Once the suction point has been developed and sealed, vacuum should be applied to the suction point using a calibrated shop vacuum with the same performance as the shop vacuum used during diagnostics.

In some cases, column pads may come up to the bottom of the slab. When this occurs, there will be a need to have the suction point just off to the side of the column pad. Connecting the riser pipe with the suction point will require an elongated oval to be cut in the concrete to overcome this

condition. The riser will be clamped into the "I" pocket of the column with a lateral section of pipe to connect the riser and the suction point which will be below the floor level at the edge of the column pad. Once completed, a three-step process will be implemented to assure that the suction point is sealed gas tight. The process will require installing a base level of backer rod and concrete followed by an application of urethane-based sealants and a top level of concrete that will be flush with the level of the existing floor. There is a detail on Sheet 4 that illustrates an off-footer suction point.

S&ME, or building owner is responsible for soil testing and disposal. It is estimated that five (5) 55 gallon drums will be required for disposal of the soil and two (2) 55 gallon drums for concrete cores and cuttings associated with suction point development.

3.3 System Piping

All horizontal pipe runs between the fans and the first suction point will be installed with one-inch slope back to a suction point for each ten feet of horizontal pipe run. All vertical pipe runs will be installed plumb. All horizontal runs after the first suction point may be run level. However, in no case will the piping be installed to create a possible water trap in the piping. All piping and fittings installed, unless otherwise noted or specified, shall be steel, electrical conduit or no hub cast iron and banded couplers.

Steel risers and electrical conduit pipe will be supported at least every six feet of horizontal run and at least every ten feet of vertical run. Suction point riser pipes will be secured to the wall or column adjacent to the suction point. Conduit channel with pipe clamps can also be used to support pipe routed along the ceiling or walls. Pipe cannot be supported by other building piping or ducts. Swivel ring or standard bolt-type clevis will be used to support pipe.

It is anticipated that there will be a need to balance airflow and equalize the distribution vacuum throughout the system. Inline gate valves shall be installed in each suction point riser pipe. This will also enable the select suction point to be throttled down or shut off if it is determined that the associated areas of influence are no longer yielding contaminant soil vapors.

3.4 Blower Installation and Start Up

There will be a total of two (2) mitigation blowers installed on the roof of the building. The locations of the blowers are indicated on the attached drawings and a typical photo example can be seen in the Pictures Section. The blowers were specified based on diagnostic vacuum distribution and airflow measurements as discussed earlier. When soil is removed from the suction point, solution channels that were not detected during the diagnostic phase are sometimes discovered. This can result in greater than expected airflow and decreased static vacuum. It cannot be projected if or when this may occur, but when it does, it is considered to be good because it can allow the consultant the opportunity to specify a lower vacuum and horsepower blower which

results in the motor operating at greater efficiency and under less load. After the suction points have been developed, they shall be individually tested using a vapor blower or calibrated vacuum to simulate the vacuum to be applied by the permanent blower. This should be done before the permanent blower is mounted to the stand for final activation. Static vacuum, airflow and the pressure differential at a temporary floor port shall be measured. This procedure and the interpretation of the data should be done by a person who is experienced and skilled in the art of evaluating suction point data and selecting blowers for optimal performance and energy efficiency.

For load distribution, the roof mounted blowers will be located directly above, or as close as possible, to roof trusses and support columns. The location and blower type are noted by a symbol in the System Drawing. The blower exhaust will be a minimum of two feet above the roofline. The blower exhaust will be a minimum of twenty feet from windows, doors, air intakes, passive relief vents or any other openings in the building that cannot be easily repaired. If radial blower discharge noise is determined to be unacceptable, sound attenuation devices are available. The final location of each blower will be field verified by the installation contractor and approved by the owner prior to installation.

3.5 Sealing

3.5.1 Cracks and Joints

Any visible expansion joints or slab cracks in the area being mitigated that have a 1/16 inch or greater opening will be sealed. Cracks will be cleaned with a walk behind rotary wheel device with a vacuum attachment to capture dust or debris. Cracks that are from concrete faults and identified expansion joints will be channel key cut prior to sealing using a crack saw fitted with a dust collecting device. Cracks will be sealed with a gun-grade urethane caulk sealant. Any openings into the slab, such as those that may occur around conduit pipe penetrations through the slab, will be cleaned and sealed with gun-grade urethane caulk. Expansion joints that are greater than ¼ inch in width or greater than 3/8 inch below the floor surface may require the installation of backer rod and self-leveling urethane sealant. All sealed floor cracks should be noted on the As Built drawing. The sealing within and surrounding an individual blower system area shall be completed prior to vacuum testing the suction points within a system.

3.5.2 Open Slab Areas

There are multiple exposed soil areas where concrete floor patching will be required. The repaired slab section should have an underlying polyethylene vapor barrier and a minimum four (4) inches of concrete.

3.5.3 Open Pits

There are three (3) areas in the slab where a section of the slab was removed, and the soil was excavated down two to three feet. The open cavities shall be filled with crushed stone and polyethylene vapor barrier installed just below the level of the existing slab. A minimum of four (4) inches of concrete shall be installed flush with the existing slab.

3.5.4 Open Pipes and Conduits

There are several open pipes and conduits, shown in the drawings, that are abandoned from previous operations. These are potential soil gas entry points that shall be addressed by evaluating the current use status and capping with concrete or urethane-based sealants as required.

3.6 Blower Wiring

Dedicated breakers shall be used for the mitigation blowers. This will prevent the blowers from being shut off when a circuit is powered down for an unrelated function. Based on the blower amperage requirements, a licensed electrician will determine the load for each circuit. The panel location and breaker number will be referenced in the final report and on the system labels. Because of the amperage requirements, a metered sub panel may be required for accuracy and ease of billing. The panel selected shall be identified and approved by the building owner. Electric panel locations, wire runs and breaker numbers shall be noted on the As Built Electrical Drawing and included in the final commissioning report.

Electrical service and a breaker panel shall be installed by the owner prior to installation of the system.

3.7 Variable Frequency Drives

The radial blowers to be installed will be equipped with Variable Frequency Drives (VFD). The installation of a VFD allows us to tune the radial blower's performance to apply the most effective and efficient vacuum to the suction points in the system. The VFDs also allow for an incremental and even distribution of voltage during start up or in the event of a power outage. The VFD will be integrated into the dynamic control and management system and, through a control logic system, will actively manage the speed of the blowers to ensure that the specified vacuum fields are maintained. The management system also provides for onsite and offsite blower control.

3.8 Vacuum Indicators

Magnehelics will be installed to indicate the static vacuum generated by each system. To the extent practicable, the range of the Magnehelics will be selected so that the indicator needle is close to or just to the right of center on the dial face. The Magnehelics shall be enclosed in protective enclosures. The low pressure Magnehelic port will be connected with 1/4" O.D. rigid polyethylene tubing to a common conveyance pipe in the system. The polyethylene tubing should

arc to a higher elevation than where it exits the riser pipe before it is connected with the Magnehelics. This will prevent condensation from running into the Magnehelics or creating a water trap in the tube. Exposed sections of tubing that run down from overhead will be enclosed in rigid conduit. Because of the size of the building and recognizing that other sections of this building may be mitigated in the future, to the extent possible, Magnehelics should be grouped into local panels with a maximum of four Magnehelic gauges in each panel. The exact location of the Magnehelic panels is at the discretion of Clean Vapor, and the Owner and should be noted in the final system As-Built drawings.

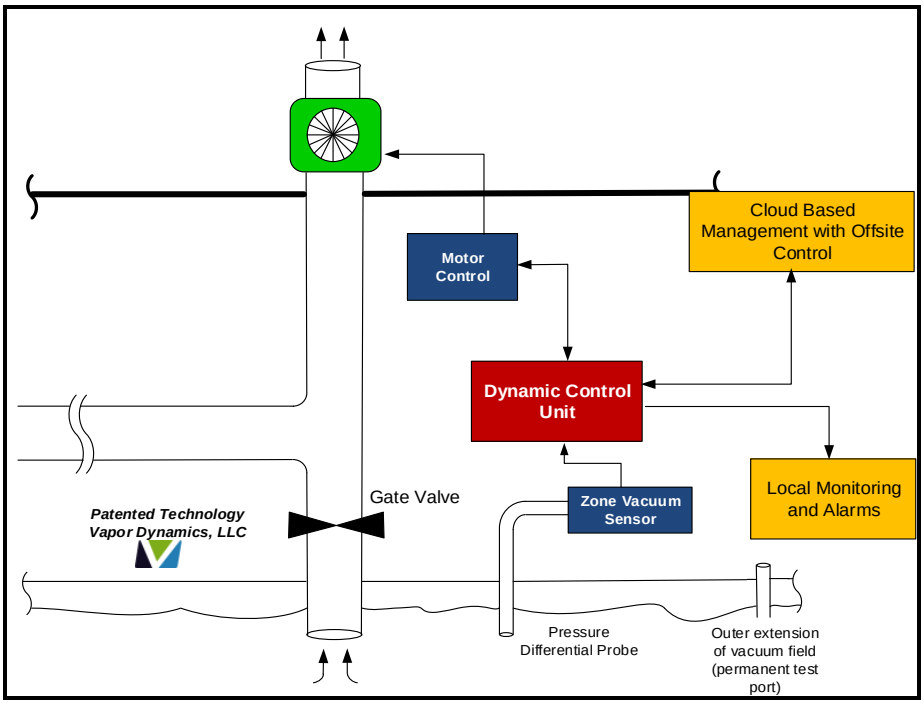
3.9 Vapor Guardian 5500 Monitoring and Controls

Clean Vapor is a certified installer of the Vapor Dynamics, LLC Vapor Guardian 5500™ monitoring and controls panel. This panel offers the owner and consultant the ability to remotely monitor the performance the VIMS including sub slab pressure differentials, static system vacuum, and power consumption. This feature will ensure that sub slab vacuum levels are not breached thus creating a potential sub slab vapor pathway. Since mitigation of this building section is anticipated to be part of a larger mitigation project it would be a sound practice to have the entire property under the surveillance of one monitoring and control system. The best time to install these components is during the fit-out process.

The Vapor Guardian 5500™ will electronically notify the consultant in the event of a system parameter fault. Electronic notifications can be triggered based on sub slab or system static vacuum set points. The system integrates the use of a 4G Verizon modem for control and data monitoring. If sufficient signal strength is not achieved at the location of the transmitter, a roof mounted antenna, which is approximately 12 inches tall, may need to be installed. The exact location of the monitoring hardware is at the discretion of installation contractor and the owner and shall be noted in the final system As-Built drawings. The following metrics may be monitored for each system; applied vacuum, vacuum at the outer extent of the pressure field, and power consumption.

The Vapor Guardian 5500™, in addition to remotely monitoring the system, will also dynamically control the blower systems. Dynamic controls enable the VIMS to maintain a constant predetermined sub slab pressure differential that is individually set for each blower as part of the electronic management and monitoring system. The system monitors the sub slab vacuum levels and self corrects for pressure induced changes that may occur from HVAC operation, exhaust hoods, wind loading and weather induced indoor pressure differentials. Pressure induced vapor intrusion is more problematic during the winter months when outside air is dense and temperature differentials are the greatest. Gusts and the resultant turbulence will also create low pressures. These low pressures are transferred into the building. The sub slab differential pressure sensor is continually monitored by a programmable logic controller (PLC) which controls the variable frequency drive (VFD) to adjust the blower speed to maintain the predetermined sub slab vacuum

set point. It is anticipated that a dampening function will need to be applied to the drive algorithm so blowers do not servo in response to varying wind speeds as there is a delay time between the applied sub slab vacuum and a change in pressure at the sensor well when depressurizing low permeable soils. The performance data from each blower is stored for analysis and reporting. All performance metrics are monitored hourly and an email is sent if a system's metrics are operating outside of a predetermined range. This system operates 24/7 and provides the opportunity for significant energy savings and reduced ongoing management and reporting costs.



Vapor Guardian Control Logic and Monitoring Diagram

3.10 Pressure Transducers

Electronic monitoring and management of the individual vacuum fields is one of the more critical components of this design. The selection of the electronic monitoring probe locations occurs during start up after the blower system has been powered. There shall be one active sub slab electronic probe location per blower system. Once the blower systems become operational, the induced vacuum field should be mapped by drilling temporary test holes so that the proportional strengths and outer extension of each blower vacuum field can be understood and documented. Once the mapping process is completed, the locations of the permanent electronic pressure differential ports are selected. These ports should be at a location that proportionally relates to the outer extension of the negative pressure field.

Once the locations of the permanent electronic test ports have been selected, a five-inch hole is cored through the slab and a cylindrical area of soil approximately eight inches in diameter by sixteen inches deep is removed from each hole. A ¾ inch PVC probe with a ¼ brass end is centered in the hole, the polyethylene tubing connected and the shielding electrical conduit secured. The void space within the hole is then filled with round washed river stone. Conduit containing the vacuum tube is placed in a channel that is cut into the concrete slab. The channel connects the probe location to the nearest wall or column where the pressure transducer and enclosure will be located. The three-inch hole in which the probe end is located is then sealed with a thin layer, one inch or less, of non-shrink grout which shall serve as a platform for a gas tight seal that is formed using self-leveling urethane. This process ensures that the vacuum levels measured by the transducer are accurate and not influenced by leakage from above the slab. The top of the probe end well and slotted conduit channel shall then be filled with patch concrete flush with the level of the existing floor.

3.11 Fire Stopping

PVC pipes that penetrate fire-rated walls or ceilings shall be protected using intumescent fire fire-rated caulk. Hilti is the recommended manufacturer of fire stopping products.

3.12 Sampling Ports

Test ports for manually measuring vacuum and airflow shall be installed in each of the riser pipes. Ports shall be drilled, taped and plugged using a 3/8-16 x ¾ stainless steel socket cap screw with a neoprene washer. Soil gas samples may also be collected from these ports. Permanent sub slab test ports will be installed at various locations throughout the individual system vacuum fields for the purpose of measuring sub slab vacuum. The vacuum measured at these permanent ports will have a somewhat linear relationship to the vacuum applied at the suction holes and measured at the pressure transducer port. The location of these ports shall be shown on the As-Built drawings.

3.13 System Labeling

A label will be installed at the disconnect switch next to the fan that says, “Active Soil Depressurization System, Do Not Alter.” The electrical circuit at the panel that is used to control the fan will be labeled as “Active Soil Depressurization System”. All risers and at least every 20 feet of exposed horizontal contaminant vent pipe length will have a label that reads “Active Soil Depressurization System” attached to the pipe. All labels shall be readable from three feet away.

4 General Installation Notes

All mitigation system components will be installed to facilitate servicing, maintenance and repair or replacement of other equipment components in or outside the building. Where mounting heights are not detailed, or dimensions not given, system materials and equipment are to be installed to

provide the maximum headroom or side clearance as is possible. The owner's representative will be contacted in cases where a conflict exists. All systems, materials and equipment will be installed level, plumb, parallel or perpendicular to other building systems and components unless otherwise specified.

Every reasonable precaution shall be made to avoid any damage to existing utilities located anywhere in the building or those located in or below the slab floor. Detailed blueprints indicating utility piping in or under the slab are not available. Undocumented sub slab utilities may alter the scope of work. A metal detecting relay box or another similar instrument should be used in conjunction with any slab drilling that does not involve wet coring.

All penetrations through the foundation walls and the roof shall be sealed. There will be no placement of piping or conduit that would inhibit intended use of any areas. No foreign materials shall be left or drawn into the vapor system piping or fan which might at a later period interfere with or in any way impair the vapor system performance. The entire system will have UL or equivalent ratings for both individual components and the entire system as applicable.

5 System Materials

I. Vapor Vent Piping
    a. PVC Schedule 40 pipe and fittings ASTM D-2665
        a. Hollow Core PVC is not permissible
    b. PVC cement clear primer will comply with ASTM F-656
    c. PVC cement adhesive will comply with ASTM D-2564
    d. 3-inch inline PVC slide valves (Valterra Bladex)

II. Piping Supports and Hardware
    a. 3"and 4" " Hanging Pipe Supports
    b. Adjustable swivel ring or standard bolt type clevis hangers
    c. Adjustable band hangers
    d. 3/8" threaded rod
    e. 1/2" threaded rod
    f. Conduit clamps
    g. Assorted bolts, nuts & washers
    h. 1 5/8" C- Profile Galvanized Unistrut
    i. 1 3/16" C- Profile Galvanized Unistrut

III. System Control Valves
    a. 3-inch inline PVC slide valves (Valterra Bladex)

IV. Vapor Blowers
    a. Cincinnati Fan HP-4A16
    b. AMG Force Blower

V. Blower Support Frames
   a. 1 5/8" C- Profile Galvanized Unistrut
   b. Dura Block Block™ Unistrut Supports
   c. Pipe Pier Unistrut Supports

VI. Visual Pressure Indicator and Protective Enclosure
   a. Dwyer Magnehelic (range to be determined)
   b. Integra Enclosures
      i. Single Magnehelic / Sensor Enclosure 16" X 14" H161407H Backing Plate PVCBP-1614
      ii. Sub Slab Sensor Enclosure (2) 8" X 8" H8084H Backing Plate PVCBP-88

VII. Sealing Materials
   a. Gun Grade Urethane Caulk (Vulkem 116)
   b. Flowable Urethane Caulk (Vulkem 45SSL)

VIII. Remote Monitoring and Dynamic Controls
   a. Vapor Guardian 5500 with internal modem (Vapor Dynamics)

IX. Dwyer Magnesense Differential Pressure Transmitters 4-20 mili amp Required
   a. Dwyer Magnesense MS 121 (3)
   b. Dwyer Series 668-7 0" – 25" w.c. (1)
   c. Dwyer Magnesense MS 111 0" - 5" w.c. (1)

Note: Hilti is the suggested manufacturer of fastening products and fire collars

6 Administrative and Final Report

6.1 Permits

It is the responsibility of the installation contractor to secure any municipal permits. The owner will need to provide building access for the municipal building inspectors or any other jurisdictional authority to inspect the relevant components of the SSDS.

6.2 Warranties

The mitigation contractor shall warranty all system components, workmanship, and a minimum cold weather sub slab vacuum level of -0.004" w.c. for a period of one year from the date of system commissioning. Sub slab vacuum extension values are based on the conditions at the date of the diagnostic measurements. The client will not incur any cost for warranty work performed during this period. Fluctuating water tables, sink holes, and other unforeseen sub slab anomalous conditions that may affect sub slab soil gas channeling after commissioning values have been achieved may be considered outside of the warranty. Repairing system damage caused by others is not included in the warranty. Clean Vapor's warranty does not apply to systems installed by others.

6.3 Final Project Report

The pressure field extension beneath the slab created by the SSDS shall be measured with a digital micro-manometer capable of reading down to 0.0001 inches water column. The slide valves in the riser pipes shall be adjusted to facilitate maximum vacuum distribution. Static vacuum measurements for each system will be recorded. All vacuum measurements will be measured in inches of water column. The exhaust airflow from the blower system shall be measured, calculated and reported in cfm.

The final report summarizing remedial activities shall include a summary of remedial activities, As-Built drawings, blower and system performance tables, photo documentation, equipment warranties and material submittals.

The As-Built drawings will be a modification of the original design print and include the specific locations of mechanical equipment and conveyance piping. The electrical panel location and breaker number will also be noted for the blower. The location of all low-pressure gauges will also be on the drawing. The title block will include the final system installation date.

Photo documentation will include at least one picture of the blower installed, the low-pressure panel, system labels, suction points, relevant sealing, fire stopping, post-mitigation vacuum testing and pictures thought to be important by the owner. Warranties and Submittals will include: blower warranties, performance and wiring information and Material “cut sheets”.

The Operations and Maintenance Section will include a table of items to be checked quarterly and annually. A copy of the final report will be maintained by Clean Vapor, and the owner.

7 Submittals

The mitigation contractor shall provide copies of submittals;

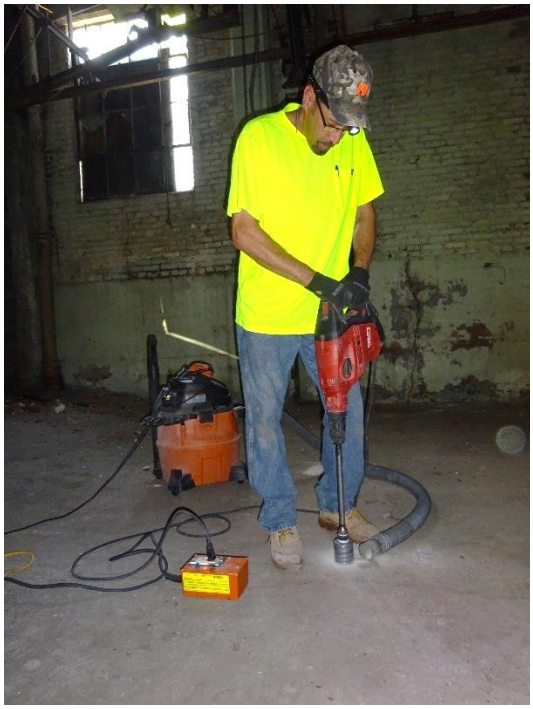
I. Pre Work Submittals
    a. Copy of applicable licenses
    b. Equipment manufacturer cut sheets
II. Post Work Submittals
    a. As-Built drawings to include all applicable mechanical component locations
    b. Final project report
    c. OM&M instructions and recommendations

8 Site Pictures

Basement Floor Level

Street Floor Level

Drilling Small Test Holes



Coring Test Suction Hole

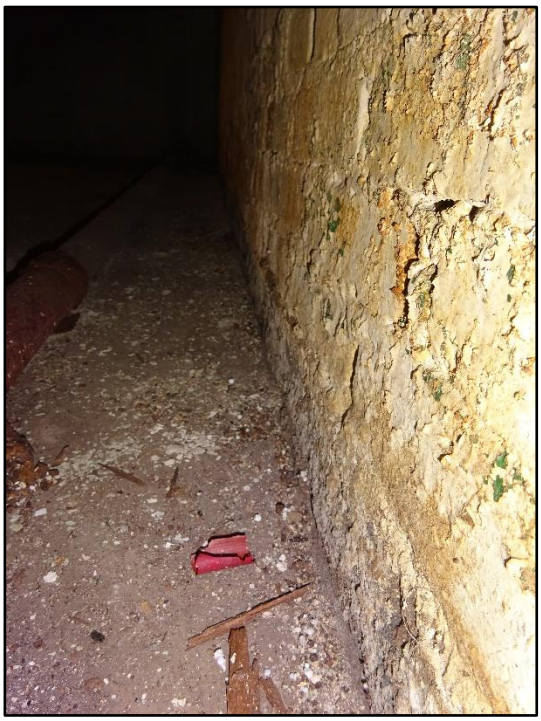
Soil from Beneath the Slab

Compacted Clay Sands on East Side of Building

Applying Known Amounts of Suction to the Sub Slab

Measuring Airflow Yields

Measuring Vacuum Field Extension with Micromanometer



Perimeter Expansion Joint Requiring Sealing

Floor Cracks Requiring Sealing

Floor Discharge Line to be Sealed

Floor Drain to be Sealed

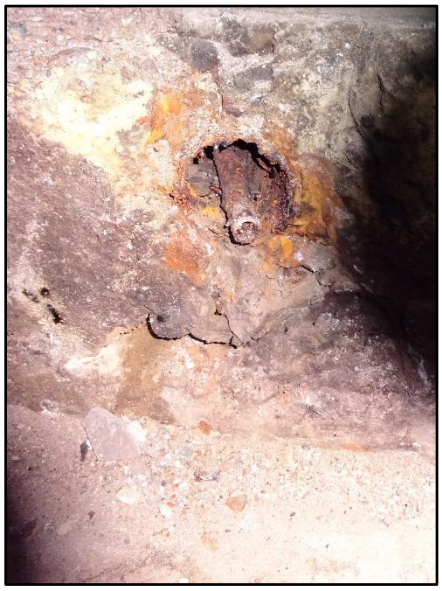
Floor Opening to be Sealed

Floor Opening to be Sealed

Floor Opening to be Sealed

Pit to be Sealed

Seal Opening Around Side Wall Drain Pipe



Side Wall Drain Line to be Sealed

Open Conduits to be Sealed

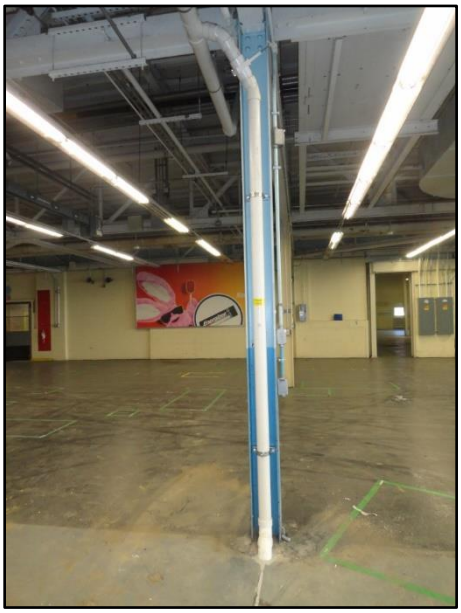
Slab Over Cork Floor

Remnant of Dry Cleaning Operation

Degraded Vaulted Concrete Beam Ceiling

8.1 Installation Example Pictures

Suction Point Sealing



Vertical and Horizontal Pipe Runs

Vertical and Horizontal Pipe Runs

Inline Slide Valve

Elongated Suction Hole Process

Steel Pipe Riser and Horizontal PVC Pipe

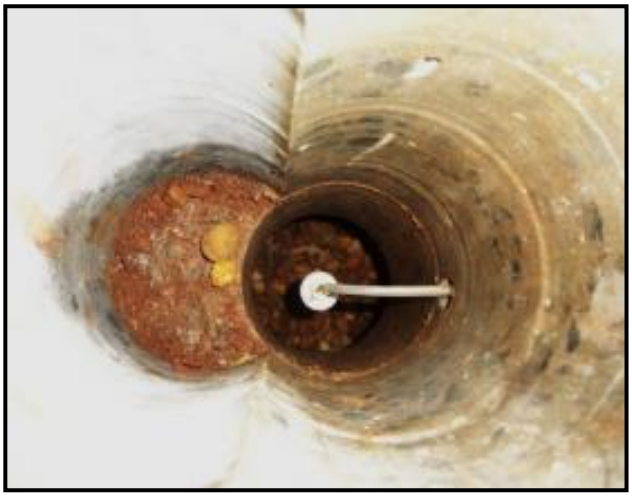
System Label

Permanent Floor Test Port

Testing System Airflow Yields

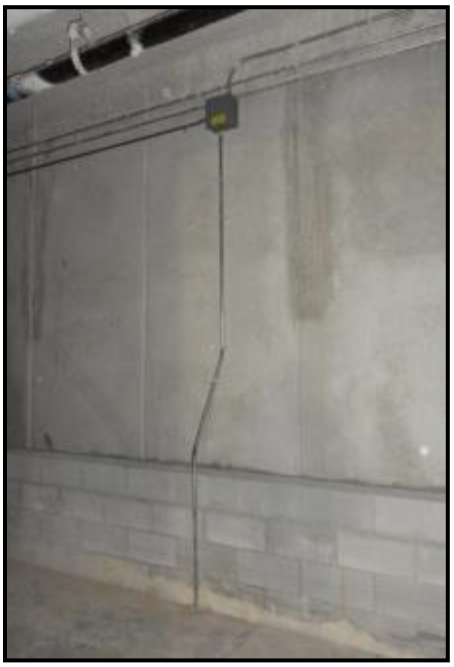
Roof Mounted Radial Blowers

Roof Mounted AMG Force Blower



Pressure Differential Probe Well

Pressure Differential Sensor and Enclosure

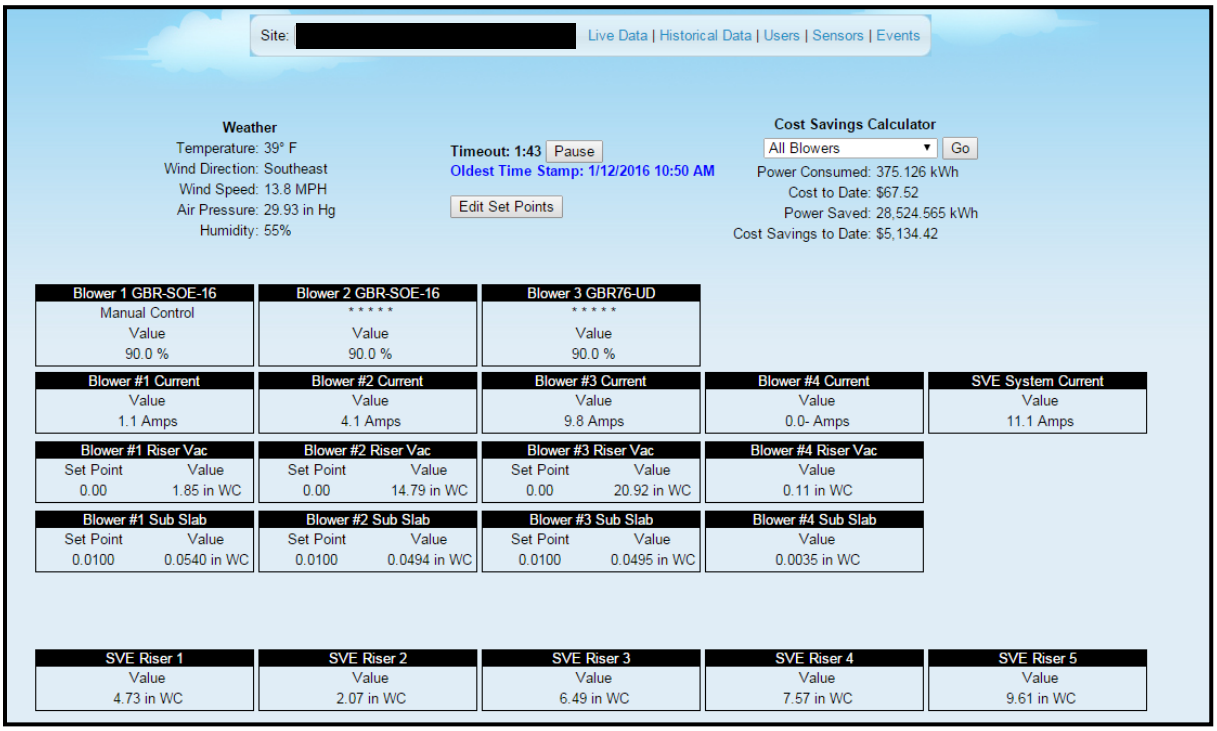


Slab Sensor Well Conduit and Enclosure

Blower Vacuum Sensor Enclosure

Magnehelic Panel and Vapor Guardian 5500 Panel

Vapor Dynamics Vapor Guardian Monitoring and Control Panel



Screenshot of Vapor Dynamics Remote Login Terminal

Appendix A – Drawings

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER SANITARY LAUNDRY
625 N BROADWAY

KNOXVILLE, TENNESSEE

JULY 13, 2018

DRAWING LIST

C	Cover
1	Diagnostic Test Holes
2	Sealing Plan
3	Suction Points & Blowers
4	Mechanical Details

CLEAN VAPOR LLC
V.O.C. & RADON PLAN DESIGN AND REMEDIATION

CLEAN VAPOR LLC

P.O. BOX 688, BLAIRSTOWN, NEW JERSEY 07825

Ph 908 362-5616 Fax 908 362-5433 www.cleanvapor.com

NORTH

FIRST FLOOR PLAN

0 5' 15'

2'-6" 10' 20'

GRAPHIC SCALE

LEGEND

T-X	TEST HOLE
S-X	SUCTION POINT
+/- PD-1	INDOOR / OUTDOOR PRESSURE DIFFERENTIAL
VP-X	EXISTING VAPOR PIN

CLEAN VAPOR LLC
P.O. BOX 688, BLAIRSTOWN, NJ 07825
Ph. 908 362-5616 Fax. 908 362-5433
www.cleanvapor.com

CLEAN VAPOR LLC
V.O.C. & RADON FLOOR DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER SANITARY LAUNDRY
625 N BROADWAY
KNOXVILLE, TENNESSEE

REVISION	DATE

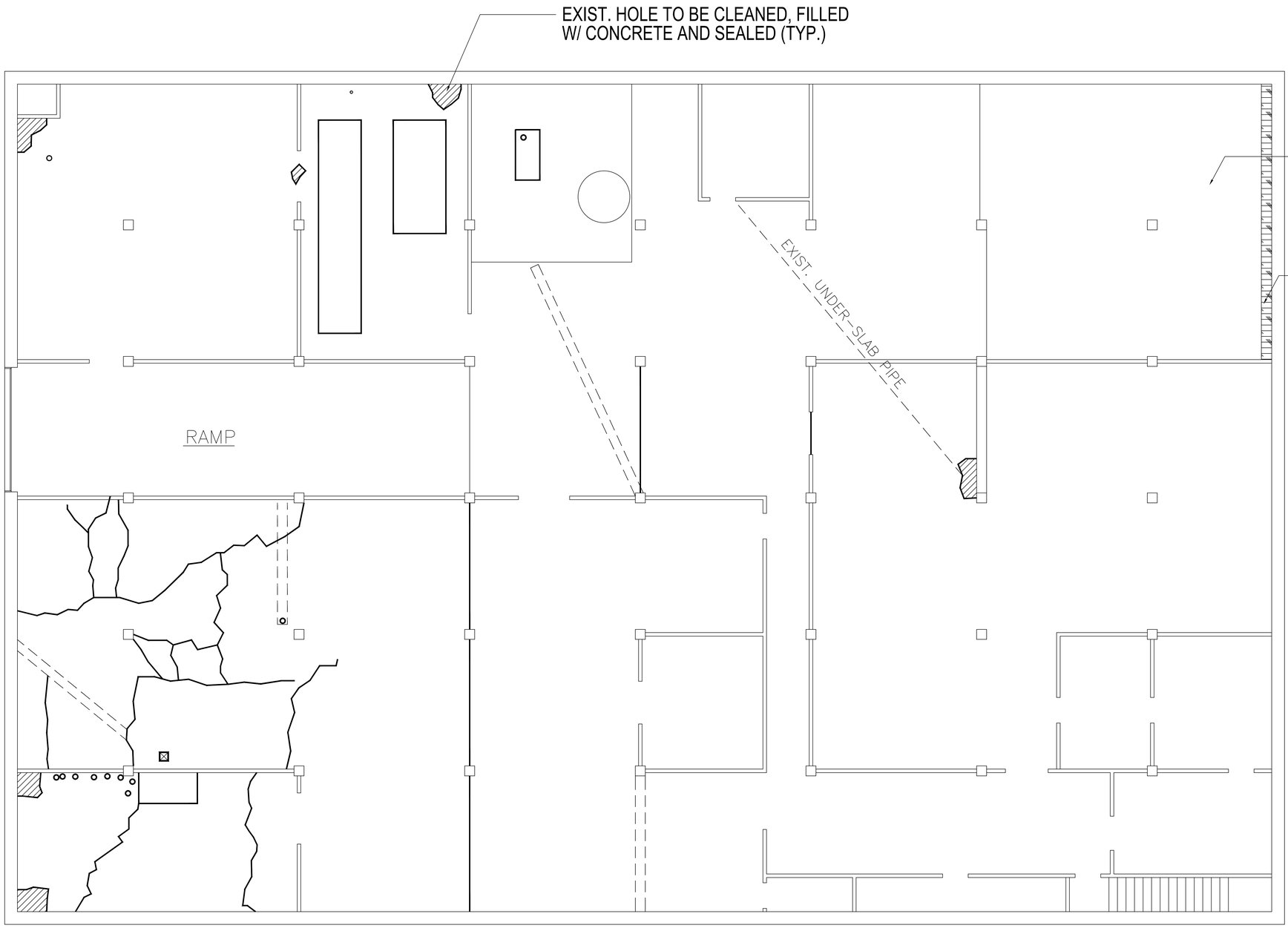
DATE	7-13-18
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

TEST HOLES

SHEET NO.

1



LEGEND

- EXPANSION JOINT
- CRACK IN CONCRETE
- EXISTING DRAIN
- EXISTING TRENCH

NORTH

0 5' 15'

2'-6" 10' 20'

GRAPHIC SCALE

FIRST FLOOR PLAN

NOTE:

SEAL ALL EXISTING EXPANSION JOINTS AS REQ'D. VERIFY THEY ARE CLEANED AND CUT FOR PROPER INSTALLATION (TYP.)

SEAL EXISTING FLOOR PERIMETER JOINTS AS REQ'D. VERIFY THEY ARE CLEANED AND CUT FOR PROPER INSTALLATION (TYP.)

SEALING NOTES:

SEE SPEC SHEET 4 FOR SEALING NOTES

CLEAN VAPOR LLC
P.O. BOX 688, BLAIRSTOWN, NJ 07825
Ph. 908 362-5616 Fax. 908 362-5433
www.cleanvapor.com

CLEAN VAPOR LLC
VOC & RADON FLOOR DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER SANITARY LAUNDRY
625 N BROADWAY
KNOXVILLE, TENNESSEE

REVISION	DATE

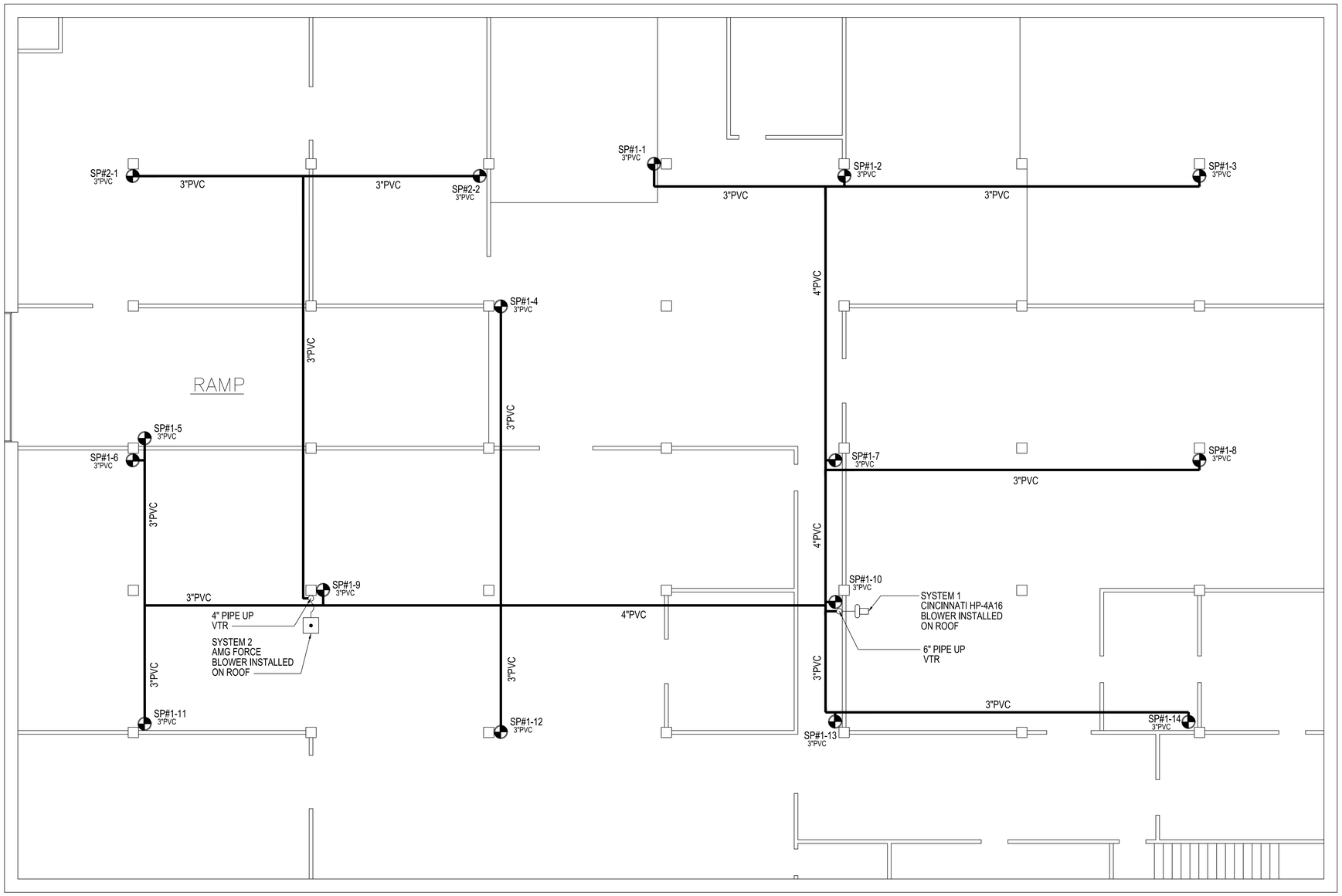
DATE	7-13-18
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

SHEET TITLE

SEALING PLAN

SHEET NO.

2



NORTH

FIRST FLOOR PLAN

0 5' 15'

2'-6" 10' 20'

GRAPHIC SCALE

LEGEND

SP#x-x x"PVC	SUCTION POINT PVC RISER
SP#x-x x"ST	SUCTION POINT STEEL RISER
x"RI	10' RISER TYPE
	CINCINNATI FAN HP-4A16
	AMG FORCE BLOWER
	MAGNEHELIC PANEL*
	ALARM PANEL*
	FIRE COLLAR*

* LOCATION TO BE DETERMINED

CLEAN VAPOR LLC
P.O. BOX 688, BLAIRSTOWN, NJ 07825
Ph. 908 362-5616 Fax. 908 362-5433
www.cleanvapor.com

CLEAN VAPOR LLC
V.O.C.'S RADON FLOW DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER SANITARY LAUNDRY
625 N BROADWAY
KNOXVILLE, TENNESSEE

REVISION	DATE

DATE	7-13-18
DRAWN BY	DAB
APPROVED	TEH
SCALE	3/16"=1'
CHECKED BY	TEH

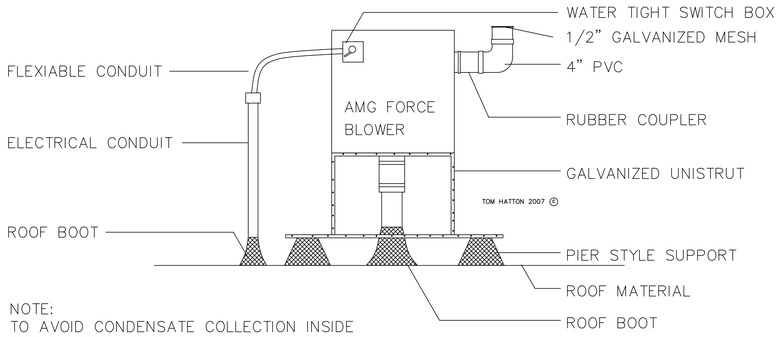
SHEET TITLE

SUCTION PT. & BLOWERS

SHEET NO.

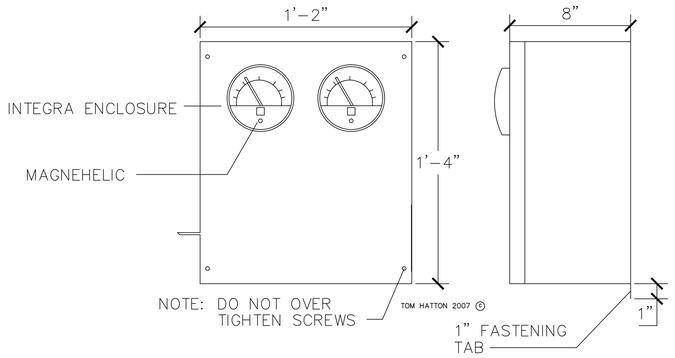
3

ROOF MOUNTED AMG FORCE BLOWER AND SUPPORT DETAIL

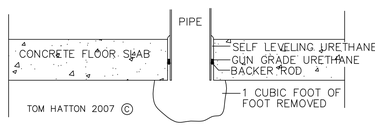


NOTE:
TO AVOID CONDENSATE COLLECTION INSIDE THE BLOWER HOUSING MOUNT AIR INTAKE FACING DOWN

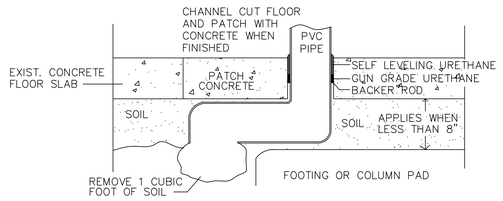
MAGNEHELIC AND PROTECTIVE BOX ENCLOSURE DETAIL



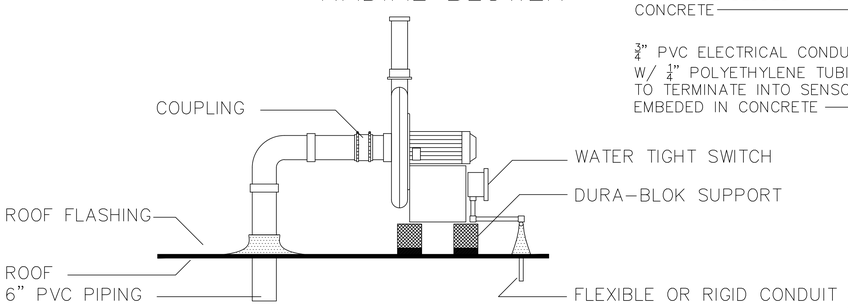
SUCTION POINT DETAIL



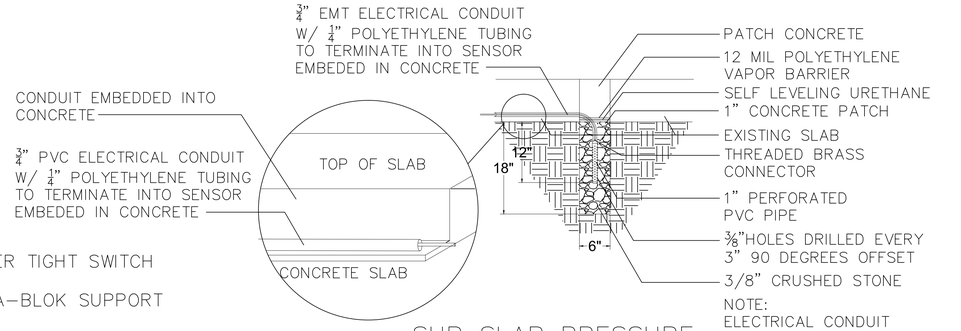
SUCTION POINT DETAIL AT FOOTER



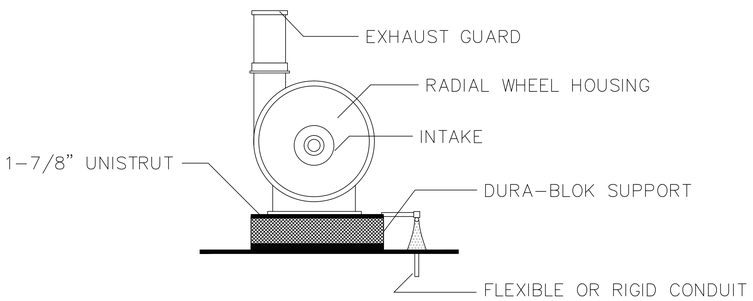
RADIAL BLOWER



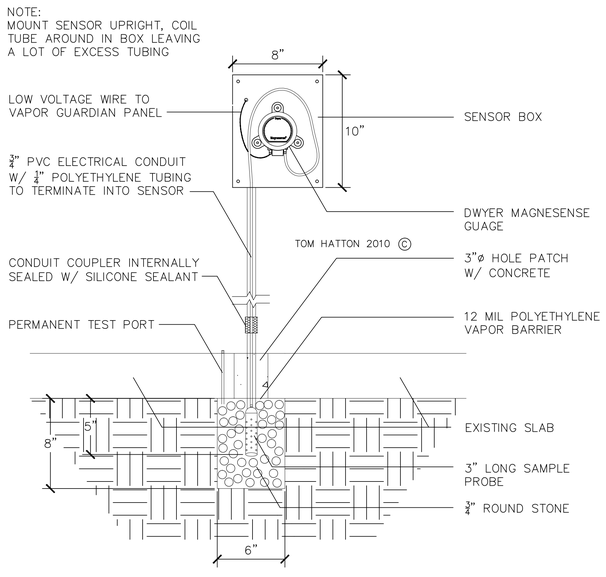
SUB SLAB PRESSURE PROBE DETAIL



RADIAL BLOWER SIDE VIEW DETAIL



SUB SLAB MONITORING WELL



EQUIPMENT SCHEDULE

I. Vapor Vent Piping
- a. PVC Schedule 40 pipe and fittings ASTM D-2665
- a. Hollow Core PVC is not permissible
- b. PVC cement clear primer will comply with ASTM F-656
- c. PVC cement adhesive will comply with ASTM D-2564
- d. 3-inch inline PVC slide valves (Valterra Bladex)

II. Piping Supports and Hardware
- a. 3"and 4" " Hanging Pipe Supports
- b. Adjustable swivel ring or standard bolt type clevis hangers
- c. Adjustable band hangers
- d. 3/8" threaded rod
- e. 1/2" threaded rod
- f. Conduit clamps
- g. Assorted bolts, nuts & washers
- h. 1 5/8" C- Profile Galvanized Unistrut
- i. 1 3/16" C- Profile Galvanized Unistrut

III. System Control Valves
- a. 3-inch inline PVC slide valves (Valterra Bladex)

IV. Vapor Blowers
- a. Cincinnati Fan HP-4A16
- b. AMG Force Blower

V. Blower Support Frames
- a. 1 5/8" C- Profile Galvanized Unistrut
- b. Dura Block BlockTM Unistrut Supports
- c. Pipe Pier Unistrut Supports

VI. Visual Pressure Indicator and Protective Enclosure
- a. Dwyer Magnehelic (range to be determined)
- b. Integra Enclosures
  - i. Single Magnehelic / Sensor Enclosure 16" X 14" H161407H Backing Plate PVCBP-1614
  - ii. Sub Slab Sensor Enclosure (2) 8" X 8" H8084H Backing Plate PVCBP-88

VII. Sealing Materials
- a. Gun Grade Urethane Caulk (Vulkem 116)
- b. Flowable Urethane Caulk (Vulkem 45SSL)

VIII. Remote Monitoring and Dynamic Controls
- a. Vapor Guardian 5500 with internal modem (Vapor Dynamics)

IX. Dwyer Magnesense Differential Pressure Transmitters 4-20 mili amp Required
- a. Dwyer Magnesense MS 121 (3)
- b. Dwyer Series 668-7 0" - 25" w.c. (1)
- c. Dwyer Magnesense MS 111 0" - 5" w.c. (1)

Note: Hilti is the suggested manufacturer of fastening products and fire collars

CLEAN VAPOR LLC
P.O. BOX 688, BLAIRSTOWN, NJ 07825
Ph. 908 362-5616 Fax. 9708 362-5433
www.cleanvapor.com
CLEAN VAPOR LLC
VOC & RADON FLOOR DESIGN AND REMEDIATION

ACTIVE SOIL DEPRESSURIZATION SYSTEM
FORMER SANITARY LAUNDRY
625 N BROADWAY
KNOXVILLE, TENNESSEE

REVISION	DATE

DATE	7-13-18
DRAWN BY	DAB
APPROVED	TEH
SCALE	NTS
CHECKED BY	TEH

SHEET TITLE
MECHANICAL DETAILS

SHEET NO.
4

Appendix B – Equipment Cut Sheets

Proposal

Clean Vapor LLC

Attention: Tom Hatton
Subject: Knoxville

ACFM	SP	Temp.	Altitude	Density	Fan RPM	BHP
490	16.0 in. wg	70°F	0 ft. ASL	0.0719 lb/ft³	3530	1.56

Qty	Description	Unit Price	Extended Price
1	Cincinnati Fan HP-4A16, Arrangement 4, Continuously Rising Wheel, CW Rotation, UB Discharge		
	MTR,2 HP,2850/3530 RPM,3PH,50/60Hz,190/380/50 & 230/460/60,TEFC, Prem Eff,FM,145T,1.15 SF,F Insul.,40C Amb.,Double Shielded Bearings,F1 Box, Conduit box ground screw,Stainless Nameplate,Cast Iron Frame, 2 HP & 1.00 SF ON 50 HZ., IE2 ON 50 HZ., MAX-PE TYPE,VFD Capable 20:1 VT		
	Shaft Seal		
	Less Inlet Flange		
	Discharge Flange-Drill Straddle Centers		
	Discharge Guard		

FAN SELECTION And PERFORMANCE

Job Name: Clean Vapor LLC
Reference: Knoxville

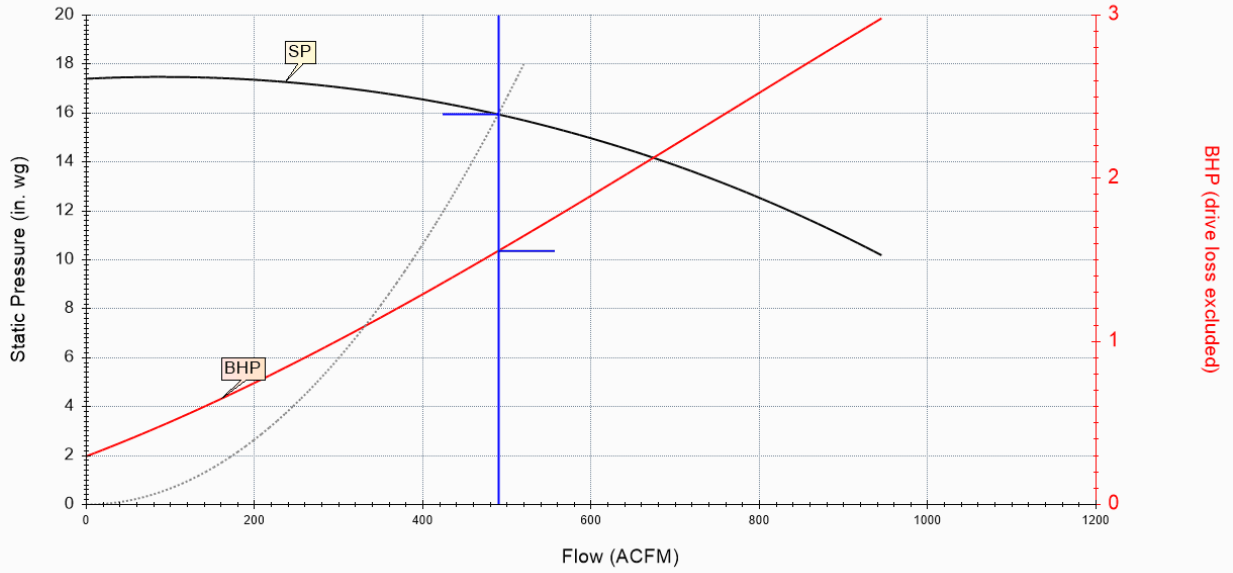
Operating Requirements

Volume, ACFM	490
Static Pressure, in. wg	16.0
Density, lb./ft.³	0.0719
Operating Temperature, °F	70
AMCA Arrangement No.	4
Motor Frequency, Hz	60
Start-Up Temperature, °F	70

Fan Selection and Specifications

Model	HP-4A16		
Fan RPM	3,530		
Wheel Description	16 CR		
Wheel Width, %	100%		
Wheel Diameter, in.	16.00		
Inlet Diameter, in.	6.00		
Outlet Velocity, ft./min.	5,606		
Fan BHP	1.55	Suggested Motor HP:	2.0
Static Efficiency, %	79.0%		
Cold Start BHP	1.55		
Construction Class	N/A		

Cincinnati Fan Model HP-4A16 with 16 CR Wheel (Full Width) @ 3,530 RPM
Rating Point: 490 ACFM @ 16.0 in. wg SP, 0.0719 lb./ft.³ Density, 1.55 BHP



FAN SOUND DATA

Job Name: Clean Vapor LLC
Reference: Knoxville

Operating Requirements

Volume, ACFM	490
Static Pressure, in. wg	16.0
Density, lb./ft.³	0.0719
Operating Temperature, °F	70
AMCA Arrangement No.	4
Motor Frequency, Hz	60
Start-Up Temperature, °F	70

Fan Selection and Specifications

Model	HP-4A16
Fan RPM	3,530
Wheel Description	16 CR
Wheel Width, %	100%
Wheel Diameter, in.	16.00
Inlet Diameter, in.	6.00
Outlet Velocity, ft./min.	5,606
Fan BHP	1.55
Static Efficiency, %	79.0%
Cold Start BHP	1.55
Construction Class	N/A

Fan Sound Data

Lp = Sound Pressure Level at a specific distance from the fan. Measured in decibels (dB) or A-weighted decibels (dB(A)) re 0.0002 microbar.
Lw = Sound Power Level of the fan. Measured in decibels (dB) or A-weighted decibels (dB(A)) re 1E-12 watt.
dB = Decibel, ten times the logarithm (base 10) of the ratio of a value to a reference value.
dB(A) = A-Weighted decibel. A-weighting corrects the spectrum for human hearing response.

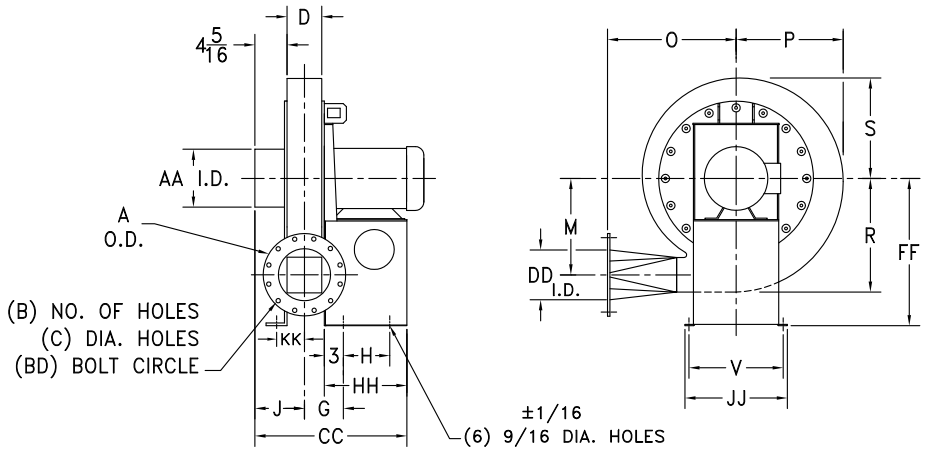
Sound Directivity Factor, Q : 2 - HemiSpherical radiation
Fan Inlet Ducting: Not Ducted
Fan Outlet Ducting: Ducted

Calculated Octave Band Sound Data (dB)

Quantity	63 Hz	125 Hz	250Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000Hz
Lw Total	90	92	89	92	88	83	77	72
Lw Inlet	87	89	86	89	85	80	74	69
Lw Outlet	87	89	86	89	85	80	74	69
Lp Total	75	77	75	77	74	69	63	58
Lp inlet	75	77	74	77	73	68	62	57
Lp outlet	63	65	62	65	61	56	50	45

Total A-weighted Sound Pressure Level, Lp dB(A)	78	at	5.0	feet from fan
Total A-weighted Sound Power Level, Lw dB(A)	93			
Blade Passage Frequency, Hz	530			

- Sound Pressure values are calculated based upon assumed environmental conditions. Actual values may vary for specific installations due to environmental factors (other noise sources, walls, duct design, etc.)
- Noise from the driver is not included in these data.
- Sound Pressure Level calculations assume free field propagation occuring outdoors.
- Duct End Corrections applied (AMCA 300-85 Appendix C).



CLOCKWISE ROTATION, BOTTOM HORIZONTAL DISCHARGE SHOWN

NOTES:
1. TEFLON SHAFT SEAL IS STANDARD.
2. MOTOR MAY EXTEND PAST END OF BASE.
3. FAN HOUSINGS ARE REVERSIBLE AND ROTATABLE IN 45° INCREMENTS.
4. IF AMCA "C" ADD: 1/8 INCH TO DIMENSIONS "G" AND "CC".
5. DISCHARGE FLANGE NOT AVAILABLE WITH DOWN BLAST DISCHARGE ON FOLLOWING MODELS: HP-8B, HP-10D, OR HP-12F.

MODEL *	MOTOR FRAME	D	G ④	H	J	M	O	P	R	S	V	AA	CC ④	FF	HH	JJ	KK	DISCHARGE FLANGE A O.D.	B	C DIA.	BD B.C.	DD
HP-4A	143T-184T	4	5	6 3/4	6 5/16	11 3/4	18	13 9/16	14 7/16	12 3/4	14 3/4	6	21 1/16	21	12 3/4	16 3/4	3	9	8	3/4	7 1/2	4
HP-4C	143T-215T			9		14 13/16	17 15/16	16 7/16	17 7/16	15 7/16	17		23 5/16	25	15	19						
	254T-256T			14									28 5/16		20							
HP-6B	143T-184T	6 3/8	6 3/16	6 3/4	7 1/2	11 3/4	18	13 9/16	14 7/16	12 3/4	14 3/4	8	23 7/16	21	12 3/4	16 3/4	4 3/16	11		7/8	9 1/2	6
	213T-215T			12 1/2									29 3/16		18 1/2							
HP-6C	143T-215T	4	5	9	6 5/16	14 13/16	17 15/16	16 7/16	17 7/16	15 7/16	17	6	23 5/16	25	15	19	3					
	254T-256T			14									28 5/16		20							
HP-6E	184T-256T	5 3/8	5 11/16	13	7	17 7/16	19 3/16	19 3/8	20 9/16	18 3/16	19	8	28 11/16	29	19	21	3 11/16					
HP-8B	143T-184T	6 3/8	6 3/16	6 3/4	7 1/2	11 3/4	19 13/16	13 9/16	14 7/16	12 3/4	14 3/4		23 7/16	21	12 3/4	16 3/4	4 3/16	13 1/2			11 3/4	8
	213T-256T			12 1/2									29 3/16		18 1/2							
HP-8D	182T-215T			9		14 13/16	19 3/4	16 7/16	17 7/16	15 7/16	17		25 11/16	25	15	19						
	254T-286TS			14									30 11/16		20							
HP-8E	184T-256T	5 3/8	5 11/16	13	7	17 7/16	21	19 3/8	20 9/16	18 3/16	19		28 11/16	29	19	21	3 11/16					
	284TS-286TS			15 1/2									31 3/16		21 1/2							
HP-10D	184T-215T	6 3/8	6 3/16	9	7 1/2	14 13/16	21 3/4	16 7/16	17 7/16	15 7/16	17		25 11/16	25	15	19	4 3/16	16	12	1	14 1/4	10
	254T-286TS			14									30 11/16		20							
HP-10F	213T-256T	7 3/8	6 11/16	13	8	17 7/16	23	19 3/8	20 9/16	18 3/16	19	10	33 3/16	29	19	21	4 11/16					
	284TS-326TS			15 1/2									39 11/16		21 1/2							
	364TS-365TS			22									30 11/16		28							
HP-12F	184T-256T			13									33 3/16		19			19			17	12
	284TS-326TS			15 1/2									39 11/16		21 1/2							
	364TS-365TS			22											28							

* COMPLETE MODEL NUMBER INCLUDES WHEEL DIA.

cincinnati fan
7697 SNIDER ROAD MASON, OHIO 45040

TOLERANCES:
ANGLES: ± 1°
FRACTIONS ±1/8
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED

SUPERSEDES:

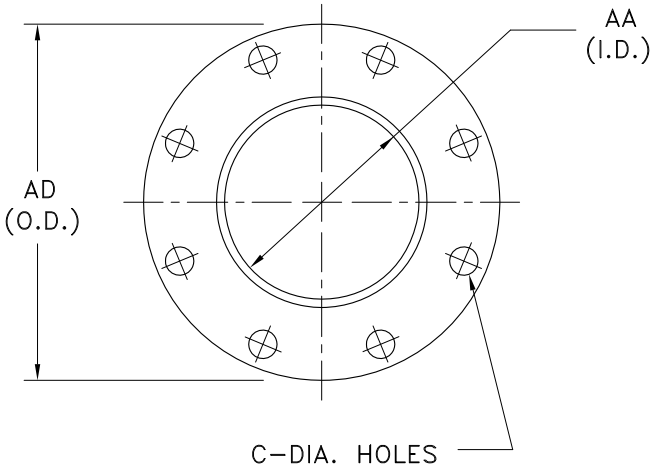
CERTIFIED DRAWING

TITLE: HP SERIES II, ARR. 4
W/O INLET FLANGE, INLET TO GROUND

A

DRAWING NO. 63065G

REV.

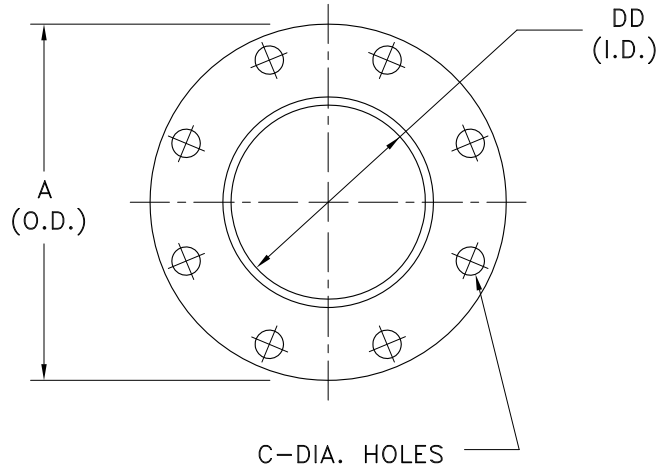


INLET FLANGE

☐ OPTIONAL HOLE PATTERN:
FLANGE HOLES ON
MAJOR CENTERLINES

NOTES:

1. STANDARD HOLE PATTERN IS FOR FLANGE HOLES TO STRADDLE CENTERLINES.
2. DRILL PATTERNS SHOWN MATCH ANSI CLASS 150.
3. FLANGE THICKNESS IS NOT ANSI.



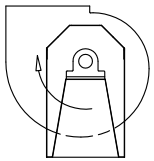
DISCHARGE FLANGE

☐ OPTIONAL HOLE PATTERN:
FLANGE HOLES ON
MAJOR CENTERLINES

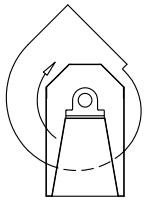
	DIMENSIONS					
MODEL	INLET SIZE	AD O.D.	AA I.D.	BD B.C.	C DIA.	D
HP–4A,4C,6C	6	11	6	9–1/2	7/8	8
HP–6B,6E,8B 8D,8E,10D	8	13–1/2	8	11–3/4	7/8	8
HP–10F,12F	10	16	10	14–1/4	1	12
HP–12G	14	21	14	18–3/4	1–1/8	12

	DIMENSIONS					
MODEL	DISCHARGE SIZE	A O.D.	DD I.D.	BD B.C.	C DIA.	D
HP–4A,4C	4	9	4	7–1/2	3/4	8
HP–6B,6C,6E	6	11	6	9–1/2	7/8	8
HP–8B,8D,8E	8	13–1/2	8	11–3/4	7/8	8
HP–10D,10F	10	16	10	14–1/4	1	12
HP–12F,12G	12	19	12	17	1	12

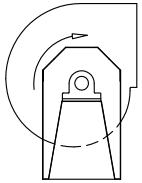
CLOCKWISE ROTATION



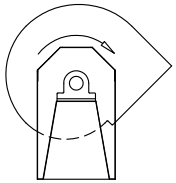
CLOCKWISE
UP BLAST



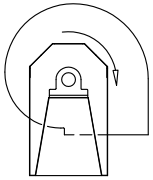
CLOCKWISE
TOP ANGULAR UP



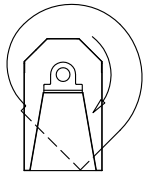
CLOCKWISE
TOP HORIZONTAL



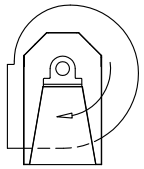
CLOCKWISE
TOP ANGULAR DOWN



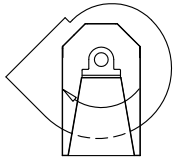
CLOCKWISE
DOWN BLAST



CLOCKWISE
BOTTOM ANGULAR DOWN

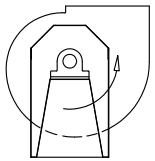


CLOCKWISE
BOTTOM HORIZONTAL

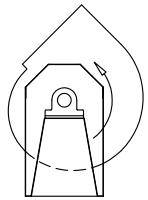


CLOCKWISE
BOTTOM ANGULAR UP

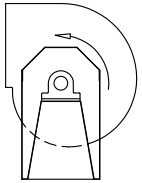
COUNTERCLOCKWISE ROTATION



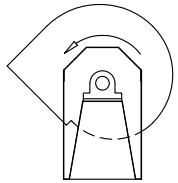
COUNTERCLOCKWISE
UP BLAST



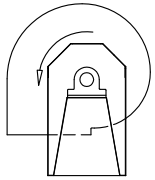
COUNTERCLOCKWISE
TOP ANGULAR UP



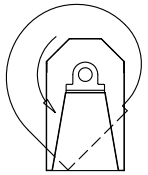
COUNTERCLOCKWISE
TOP HORIZONTAL



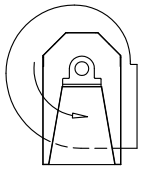
COUNTERCLOCKWISE
TOP ANGULAR DOWN



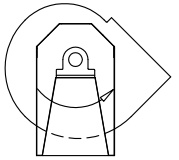
COUNTERCLOCKWISE
DOWN BLAST



COUNTERCLOCKWISE
BOTTOM ANGULAR DOWN



COUNTERCLOCKWISE
BOTTOM HORIZONTAL

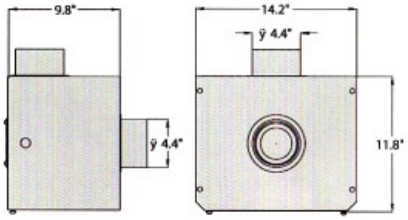


COUNTERCLOCKWISE
BOTTOM ANGULAR UP

NOTES:

1. DIRECTION OF ROTATION IS DETERMINED FROM DRIVE SIDE OF FAN.
2. SAME AS AMCA STANDARD 99–2406.

AMG Force



AMG Force, Radon Extract Fan Performance Figures

				CFM at STATIC PRESSURE in. w.g.										
Model	**Volts**	**Watts**	**Max. Amps**	**0"**	**0.5"**	**1.0"**	**1.5"**	**2.0"**	**2.5"**	**3.0"**	**3.5"**	**4.0"**	**4.5"**	**5"**
AMG Force	120V 60Hz	302	2.48	240	223	207	191	174	155	133	110	83	55	28
Weight: 8 lbs. 3 oz. Fan Speed: 3000 rpm														

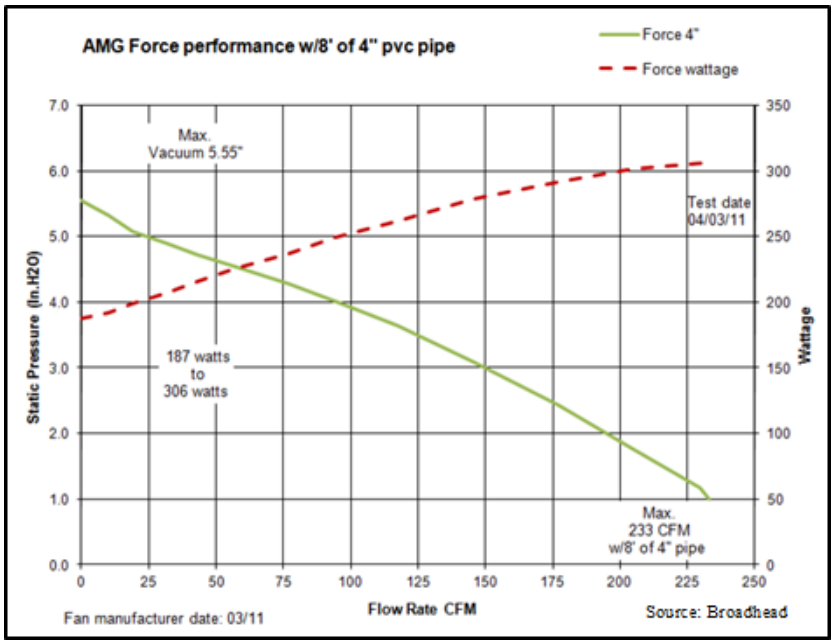
Performance shown is for installation type D - Ducted inlet, Ducted outlet.
Speed (rpm) shown is nominal. Performance is based on actual speed of test.
Performance ratings do not include the effects of appurtenances in the air stream.
The performance figures shown have been corrected to standard air density.

*We have brackets, too!

To Order Call 1 (800) 806-7866 or 1 (877) 264-3267

Festa Manufacturing Enterprises, LLC.
Festa International Radon Supply Technologies, Co.
Festa Radon Technologies Co.

1 (800) 806-7866 1 (877) 264-3267
47A Progress Avenue, Cranberry Twp., PA 16066



DURA-BLOK™ Rooftop Supports

DURA-BLOK is made from 100% recycled rubber and qualifies for LEED credits. Reflective strips on both sides allow for easy product visibility.

Channels are through bolted on all sizes for added strength and a 1" (25.4mm) gap between blocks allows water to flow freely around longer assemblies.

Product composition is not sharp or abrasive, helping to extend the roof life and no penetration through the roof is required.

The DURA-BLOK dampens vibration, needs no supplemental rubber pad, and will not float or blow away.

DURA-BLOK can be used to support piping, HVAC/Ducts, roof walkways, conduit and cable tray.

Base Only

DBP


DBM

Base Only

Dimensions - 4" (101mm) High x 6" (152mm) Wide x Base Length

Material - 100% recycled rubber, UV resistant

Ultimate Load Capacity - (uniform load) *

DBP = 500 lbs. (2.22kN)

DBM = 200 lbs. (0.89kN)

DURA-BLOK channel support is designed as an economical support for piping systems, cable tray, HVAC equipment and many other applications. The DURA-BLOK is UV resistant and is suitable for any type of roofing material or other flat surfaces. Material effectively accepts screw fasteners for securing accessories.

Part No.	Weight Each
DBP	4.48 (2.03kg)
DBM	2.35 (1.07kg)

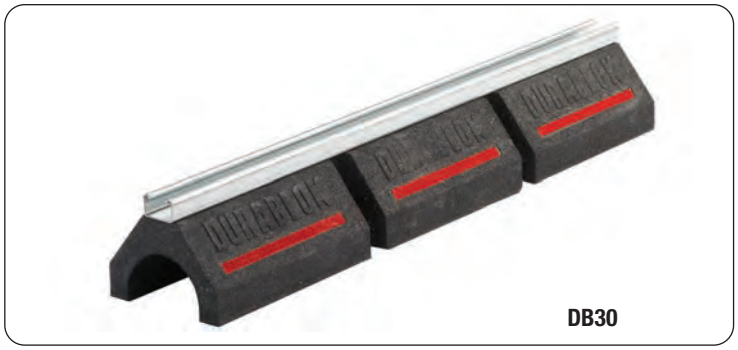
Part No.	Height	Width	Length
DBP	4" (101mm)	6" (152mm)	9.6" (244mm)
DBM	4" (101mm)	6" (152mm)	4.8" (122mm)

*** For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

DB - Series

DB10



DB30

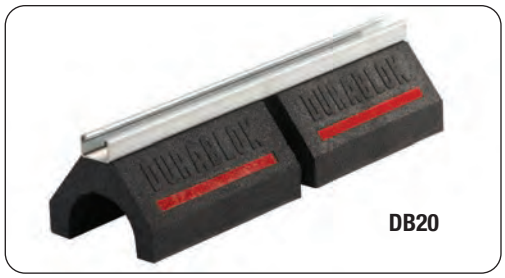
Base with 14 ga. (1.9mm) Galv. Channel - 1" (25.4mm) high

Dimensions - 5" (127mm) High x 6" (152mm) Wide x Length (overall length)
Material - 100% recycled rubber, UV resistant
Ultimate Load Capacity - (uniform load) *

DB5 = 500 lbs. (2.22kN)
DB10 = 500 lbs. (2.22kN)
DB20 = 1,000 lbs. (4.45kN)
DB30 = 1,500 lbs. (6,67kN)
DB40 = 2,000 lbs. (8.89kN)
DB48 = 2,500 lbs. (11.12kN)

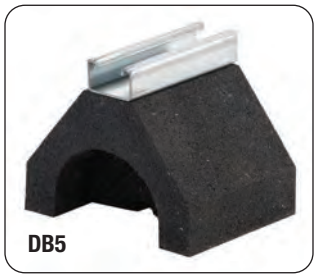
DURA-BLOK DB-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications. The DURA-BLOK is UV resistant and suitable for installation on any type of roofing material or other flat surfaces. For sloped roofs see adjustable hinge fitting (B634).

Part No.	Weight Each
DB5	2.75 (1.25kg)
DB10	5.28 (2.39kg)
DB20	10.63 (4.82kg)
DB30	15.99 (7.25kg)
DB40	21.34 (9.68kg)
DB48	26.70 (12.4kg)



DB20

Part No.	Height	Width	Overall Length
DB5	5" (127mm)	6" (152mm)	4.8" (122mm)
DB10	5" (127mm)	6" (152mm)	9.6" (244mm)
DB20	5" (127mm)	6" (152mm)	20.2" (513mm)
DB30	5" (127mm)	6" (152mm)	30.8" (782mm)
DB40	5" (127mm)	6" (152mm)	41.4" (1052mm)
DB48	5" (127mm)	6" (152mm)	52.0" (1321mm)


DB5

For pipe straps/clamps, rollers and roller supports that can be used with these DURA-BLOK supports, see page 284.

*** For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

DB6 - Series

Base with 12 ga. (2.6mm) Galv. Channel - 2 7/16" (62mm) high

Dimensions - 6 7/16" (163mm) High x 6" (152mm) Wide x Length (overall length)
Material - 100% recycled rubber, UV resistant
Ultimate Load Capacity - (uniform load) *

DB610 = 500 lbs. (2.22kN)
DB620 = 1,000 lbs. (4.45kN)
DB630 = 1,500 lbs. (6.67kN)
DB640 = 2,000 lbs. (8.89kN)
DB648 = 2,500 lbs. (11.12kN)

DURA-BLOK DB6-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications. The DURA-BLOK is UV resistant and suitable for installation on any type of roofing material or other flat surfaces. For sloped roofs see adjustable hinge fitting (B634).

Part No.	Weight Each
DB610	6.36 (2.88kg)
DB620	12.90 (5.85kg)
DB630	19.45 (8.82kg)
DB640	26.00 (11.79kg)
DB648	32.55 (14.76kg)

Part No.	Height	Width	Overall Length
DB610	6 7/16" (167mm)	6" (152mm)	9.6" (244mm)
DB620	6 7/16" (167mm)	6" (152mm)	20.2" (513mm)
DB630	6 7/16" (167mm)	6" (152mm)	30.8" (782mm)
DB640	6 7/16" (167mm)	6" (152mm)	41.4" (1052mm)
DB648	6 7/16" (167mm)	6" (152mm)	52.0" (1321mm)

For pipe straps/clamps, rollers and roller supports that can be used with these DURA-BLOK supports, see page 284.

*** For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

DB10 - Series

Two (2) Bases with 12 ga. (2.6mm) Galv. Channel - 1 5/8" (41mm) high

Dimensions - 5 5/8" (143mm) High x 6" (152mm) Wide x Length (overall length)
Material - 100% recycled rubber, UV resistant
Ultimate Load Capacity - 1,000 lbs. (4.45kN) (uniform load) *

DURA-BLOK DB10-Series channel support is designed for superior support of piping systems, cable tray, HVAC equipment, walkway systems and many other applications. The DURA-BLOK is UV resistant and suitable for installation on any type of roofing material or other flat surfaces.

Part No.	Weight Each
DB10-28	13.16 (5.97kg)
DB10-36	14.36 (6.51kg)
DB10-42	15.52 (7.04kg)
DB10-50	16.45 (7.46kg)
DB10-60	17.94 (8.14kg)

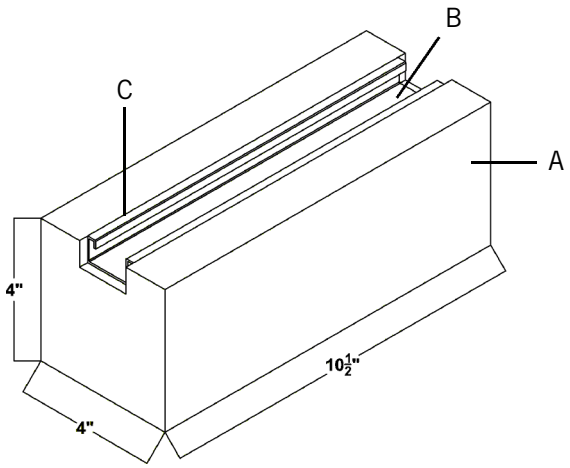
Part No.	Height	Individual Base Length	Bridge Length
DB10-28	5 5/8" (143mm)	9.6" (244mm)	28" (711mm)
DB10-36	5 5/8" (143mm)	9.6" (244mm)	36" (914mm)
DB10-42	5 5/8" (143mm)	9.6" (244mm)	42" (1067mm)
DB10-50	5 5/8" (143mm)	9.6" (244mm)	50" (1270mm)
DB10-60	5 5/8" (143mm)	9.6" (244mm)	60" (1524mm)

For pipe straps/clamps, rollers and roller supports that can be used with these DURA-BLOK supports, see page 284.

*** For Roof Loading, Consult Roofing Manufacturer or Engineer. As with most commercial roofs, the weakest point may be the insulation board beneath the rubber membrane.**

PIPE PIER® support blocks have been designed and engineered specifically for rootop and raised floor applications. The PIPE PIER® Classic series is offered in two different heights:

- ☐ **PIPE PIER® 50H6 –** 6"x4"x10-1/2" with a 50 lbs max load
- ☐ **PIPE PIER® 50H4 –** 4"x4"x10-1/2" with a 50 lbs max load



Components

A. Closed-cell, medium density, black polyethylene foam Ethafoam HS 45*

B. 14 Gauge Strut Channel

C. Hot melt adhesive-bonding strut to foam block BONDMASTER INSTAWELD 34-3378

**Trademark of Dow Chemical Co.*

Ethafoam HS 45* polyethylene foam offers excellent strength, resistance to creep under loadings up to 5.0 psi, vibration & shock absorbency and water resistance characteristics. Ethafoam HS 45 has successfully passed MVSS 302 flammability testing and meets or exceeds the requirements for U.S. Federal Standard PPP-C-1752C, Type III.

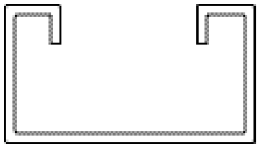
**Trademark of Dow Chemical Co.*

Physical Properties	Test Method	Direction	Value
Density	D3575, Suffix W, Method B	N/A	3.9 pcf
Compression Set	ASTM D 3575, Suffix B	Vertical	<15%
Compression Creep @ 5.0 psi (1000 hr/72 F)	ASTM D 3575, Suffix BB	Vertical	<10%
Thermal Stability	ASTM D 3575, Suffix S	N/A	<1%
Water Absorption	ASTM D 3575, Suffix L	N/A	<0.2 lb/sq ft

---

14 Gauge Strut Channel

The 14 gauge strut channel is cold roll-formed from high quality carbon steel. The channel finish is hot dipped mill galvanized. The raw steel used conforms to ASTM 570 GR 33 and ASTM A446 GR A.



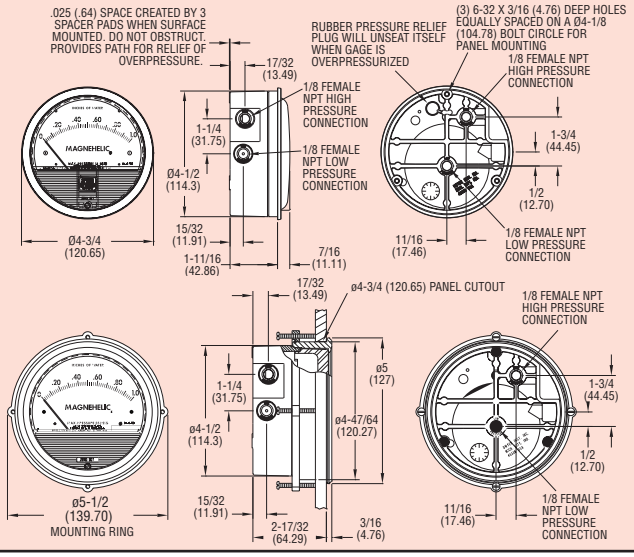
BONDMASTER INSTAWELD 34-3378 is a sprayable heat & moisture-resistant hot melt adhesive. It has a 350 degree melting point and is applied by a nozzle applicator during the manufacturing process. It conforms to MS-CC926.

Series 2000

Magnehelic® Differential Pressure Gages

Indicate Positive, Negative or Differential, Accurate within 2%

RoHS



Select the Dwyer® Magnehelic® gage for high accuracy – guaranteed within 2% of full-scale – and for the wide choice of 81 models available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® gage movement, it quickly indicates low air or non-corrosive gas pressures – either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

The Magnehelic® gage is the industry standard to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

Mounting

A single case size is used for most models of Magnehelic® gages. They can be flush or surface mounted with standard hardware supplied. Although calibrated for vertical position, many ranges above 1″ may be used at any angle by simply re-zeroing. However, for maximum accuracy, they must be calibrated in the same position in which they are used. These characteristics make Magnehelic® gages ideal for both stationary and portable applications. A 4-9/16″ hole is required for flush panel mounting. Complete mounting and connection fittings, plus instructions, are furnished with each instrument. See page 7 for more information on mounting accessories.

Flush, Surface or Pipe Mounted

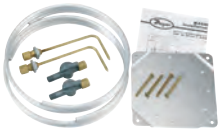
Enclosure Mounted

SPECIFICATIONS

Service: Air and non-combustible, compatible gases (natural gas option available).
Note: May be used with hydrogen. Order a Buna-N diaphragm. Pressures must be less than 35 psi.
Wetted Materials: Consult factory.
Housing: Die cast aluminum case and bezel, with acrylic cover. Exterior finish is coated gray to withstand 168 hour salt spray corrosion test.
Accuracy: ±2% of FS (±3% on - 0, -100 Pa, -125 Pa, 10MM and ±4% on - 00, -60 Pa, -6MM ranges), throughout range at 70°F (21.1°C).
Pressure Limits: -20 in Hg to 15 psig† (-0.677 to 1.034 bar); MP option: 35 psig (2.41 bar); HP option: 80 psig (5.52 bar).
Overpressure: Relief plug opens at approximately 25 psig (1.72 bar), standard gages only. See Overpressure Protection Note on next page.
Temperature Limits: 20 to 140°F* (-6.67 to 60°C). -20°F (-28°C) with low temperature option.
Size: 4″ (101.6 mm) diameter dial face.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.
Process Connections: 1/8″ female NPT duplicate high and low pressure taps - one pair side and one pair back.
Weight: 1 lb 2 oz (510 g), MP & HP 2 lb 2 oz (963 g).
Standard Accessories: Two 1/8″ NPT plugs for duplicate pressure taps, two 1/8″ pipe thread to rubber tubing adapter, and three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for three adapters in MP & HP gage accessories.)
Agency Approval: RoHS. **Note:** -SP models not RoHS approved.
†For applications with high cycle rate within gage total pressure rating, next higher rating is recommended. See Medium and High pressure options at lower left.

ACCESSORIES

Model A-432 Portable Kit
Combine carrying case with any Magnehelic® gage of standard range, except high pressure connection. Includes 9 ft (2.7 m) of 3/16″ ID rubber tubing, standhang bracket and terminal tube with holder.



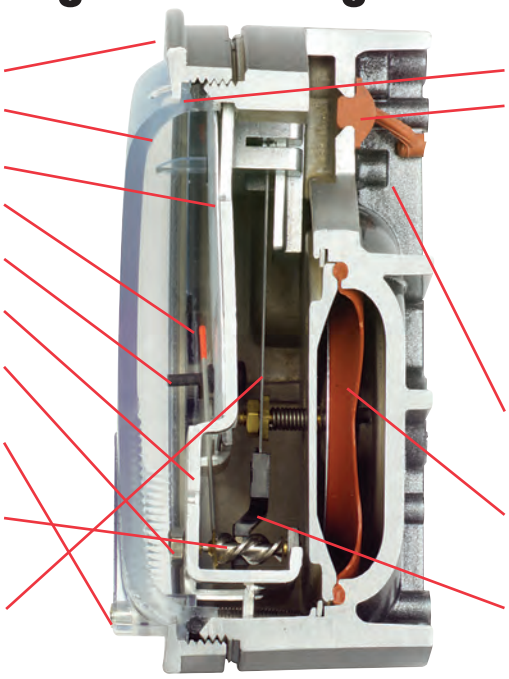
Model A-605 Air Filter Gage Accessory Kit
Adapts any standard Magnehelic® gage for use as an air filter gage. Includes aluminum surface mounting bracket with screws, two 5 ft (1.5 m) lengths of 1/4″ aluminum tubing two static pressure tips and two molded plastic vent valves, integral compression fittings on both tips and valves.

A-605B Air Filter Gage Accessory Kit, Air filter kit with two plastic open/close valves, two 4″ steel static tips, plastic tubing and mounting flange

A-605C Air Filter Gage Accessory Kit, Air filter kit with two plastic open/close valves, two plastic static tips, plastic tubing and mounting flange

Series 2000

Magnehelic® Gage Models & Ranges



Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

Precision litho-printed scale is accurate and easy to read.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on the helix shaft.

Pointer stops of molded rubber prevent pointer over-travel without damage.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Jeweled bearings are shock-resistant mounted; provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Zero adjustment screw is conveniently located in the plastic cover, and is accessible without removing cover. O-ring seal provides pressure tightness.

Helix is precision made from an alloy of high magnetic permeability. Mounted in jeweled bearings, it turns freely, following the magnetic field to move the pointer across the scale.

Calibrated range spring is flat spring steel. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

O-ring seal for cover assures pressure integrity of case.

OVERPRESSURE PROTECTION
Blowout plug is comprised of a rubber plug on the rear which functions as a relief valve by unseating and venting the gage interior when over pressure reaches approximately 25 psig (1.7 bar). To provide a free path for pressure relief, there are four spacer pads which maintain 0.023˝ clearance when gage is surface mounted. Do not obstruct the gap created by these pads. The blowout plug is not used on models above 180˝ of water pressure, medium or high pressure models, or on gages which require an elastomer other than silicone for the diaphragm. The blowout plug should not be used as a system overpressure control. High supply pressures may still cause the gage to fail due to over pressurization, resulting in property damage or serious injury. Good engineering practices should be utilized to prevent your system from exceeding the ratings or any component.

Die cast aluminum case is precision made and iridite-dipped to withstand 168 hour salt spray corrosion test. Exterior finished in baked dark gray hammerloid. One case size is used for all standard pressure options, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded O-ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Samarium Cobalt magnet mounted at one end of range spring rotates helix without mechanical linkages.

Model	Range Inches of Water
2000-00N†••	.05-0-.2
2000-00†••	0-.25
2000-0†•	0-.50
2001	0-1.0
2002	0-2.0
2003	0-3.0
2004	0-4.0
2005	0-5.0
2006	0-6.0
2008	0-8.0
2010	0-10
2012	0-12
2015	0-15
2020	0-20
2025	0-25
2030	0-30
2040	0-40
2050	0-50
2060	0-60
2080	0-80
2100	0-100
2120	0-120
2150	0-150
2160	0-160
2180*	0-180
2250*	0-250
Zero Center Ranges	
2300-00†••	0.125-0-0.125
2300-0†•	.25-0-.25
2301	.5-0-.5
2302	1-0-1
2304	2-0-2
2310	5-0-5
2320	10-0-10
2330	15-0-15

Model	Range PSI
2201	0-1
2202	0-2
2203	0-3
2204	0-4
2205	0-5
2210*	0-10
2215*	0-15
2220*	0-20
2230**	0-30

Model	Range, CM of Water
2000-15CM	0-15
2000-20CM	0-20
2000-25CM	0-25
2000-50CM	0-50
2000-80CM	0-80
2000-100CM	0-100
2000-150CM	0-150
2000-200CM	0-200
2000-250CM	0-250
2000-300CM	0-300
Zero Center Ranges	
2300-4CM	2-0-2
2300-10CM	5-0-5
2300-30CM	15-0-15

†These ranges calibrated for vertical scale position.
• Accuracy +/-3%
• • Accuracy +/-4%
*MP option standard
**HP option standard

Model	Range MM of Water
2000-6MM†••	0-6
2000-10MM†•	0-10
2000-15MM	0-15
2000-25MM	0-25
2000-30MM	0-30
2000-50MM	0-50
2000-80MM	0-80
2000-100MM	0-100
2000-125MM	0-125
2000-150MM	0-150
2000-200MM	0-200
2000-250MM	0-250
2000-300MM	0-300
Zero Center Ranges	
2300-6MM†••	3-0-3
2300-10MM†•	5-0-5
2300-20MM†•	10-0-10

Model	Range, Pa
2000-60NPA†••	10-0-50
2000-60PA†••	0-60
2000-100PA†•	0-100
2000-125PA†•	0-125
2000-250PA	0-250
2000-300PA	0-300
2000-500PA	0-500
2000-750PA	0-750
2000-1000PA	0-1000
Zero Center Ranges	
Model	**Range, Pa**
2300-60PA†••	30-0-30
2300-100PA†•	50-0-50
2300-120PA	60-0-60
2300-200PA	100-0-100
2300-250PA	125-0-125
2300-300PA	150-0-150
2300-500PA	250-0-250
2300-1000PA	500-0-500

Model	Range, kPa
2000-0.5KPA	0-0.5
2000-1KPA	0-1
2000-1.5KPA	0-1.5
2000-2KPA	0-2
2000-2.5KPA	0-2.5
2000-3KPA	0-3
2000-4KPA	0-4
2000-5KPA	0-5
2000-8KPA	0-8
2000-10KPA	0-10
2000-15KPA	0-15
2000-20KPA	0-20
2000-25KPA	0-25
2000-30KPA	0-30
Zero Center Ranges	
2300-1KPA	.5-0-.5
2300-2KPA	1-0-1
2300-2.5KPA	1.25-0-1.25
2300-3KPA	1.5-0-1.5

Dual Scale Air Velocity Units
For use with pitot tube

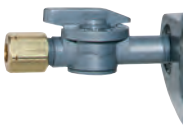
Model	Range in W.C./ Velocity F.P.M.
2000-00AV†••	0-.25/300-2000
2000-0AV†•	0-.50/500-2800
2001AV	0-1.0/500-4000
2002AV	0-2.0/1000-5600
2005AV	0-5.0/2000-8800
2010AV	0-10/2000-12500

Dual Scale English/Metric Models

Model	Range, in w.c.	Range, Pa or kPa
2000-00D†••	0-.25	0-62 Pa
2000-0D†•	0-0.5	0-125 Pa
2001D	0-1.0	0-250 Pa
2002D	0-2.0	0-500 Pa
2003D	0-3.0	0-750 Pa
2004D	0-4.0	0-1.0 kPa
2005D	0-5.0	0-1.25 kPa
2006D	0-6.0	0-1.5 kPa
2008D	0-8.0	0-2.0 kPa
2010D	0-10	0-2.5 kPa
2015D	0-15	0-3.7 kPa
2020D	0-20	0-5 kPa
2025D	0-25	0-6.2 kPa
2050D	0-50	0-12.4 kPa
2060D	0-60	0-15 kPa

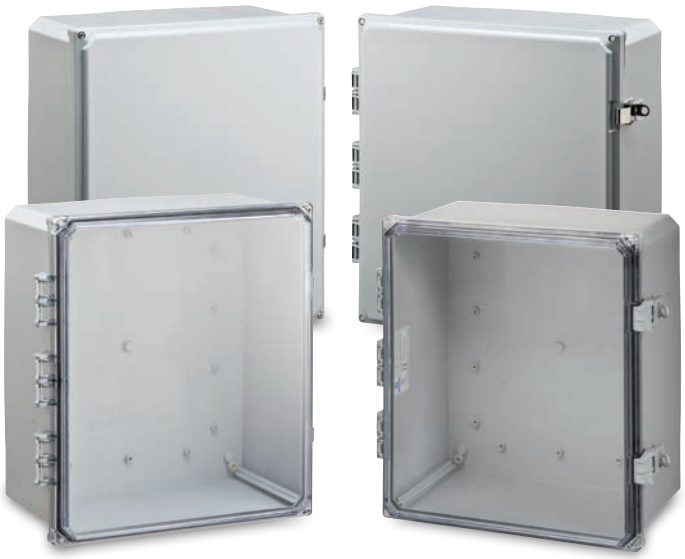
VELOCITY AND VOLUMETRIC FLOW UNITS
Scales are available on the Magnehelic® that read in velocity units (FPM, m/s) or volumetric flow units (SCFM, m^3/s, m^3/h). Stocked velocity units with dual range scales in inches w.c. and feet per minute are shown above. For other ranges contact the factory.
When ordering volumetric flow scales please specify the maximum flow rate and its corresponding pressure. Example: 0.5 in w.c. = 16,000 CFM.

ACCESSORIES
A-321, Safety Relief Valve
A-448, 3-piece magnet kit for mounting Magnehelic® gage directly to magnetic surface
A-135, Rubber gasket for panel mounting
A-401, Plastic Carry Case

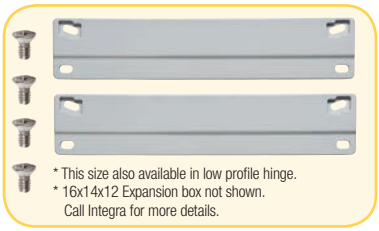


A-310A 3-Way Vent Valves
In applications where pressure is continuous and the Magnehelic® gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

16X14X7 PREMIUM LINE



Comes with feet or flanges



* This size also available in low profile hinge.
* 16x14x12 Expansion box not shown.
Call Integra for more details.

ECO FRIENDLY

MADE IN THE USA

PREMIUM POLYCARBONATE ENCLOSURE

Features and Benefits

- Standard color – light gray with a gloss finish.
- Best material – bases, opaque covers and clear covers are all made of high-impact, UV resistant polycarbonate.
- Easy ordering – one part number includes base, lid, mounting feet or flanges and all lid fastening hardware (mounting panels sold separately).
- Flexible interior mounting – features the unique and patented Integra adjustable depth "T-Rail" back panel mounting system (back panel and adjustable brackets sold separately).
- Features multiple bosses for easy installation of devices and DIN rails.
- UL-50 / c-UL Listed (files # E229365, # E207562)

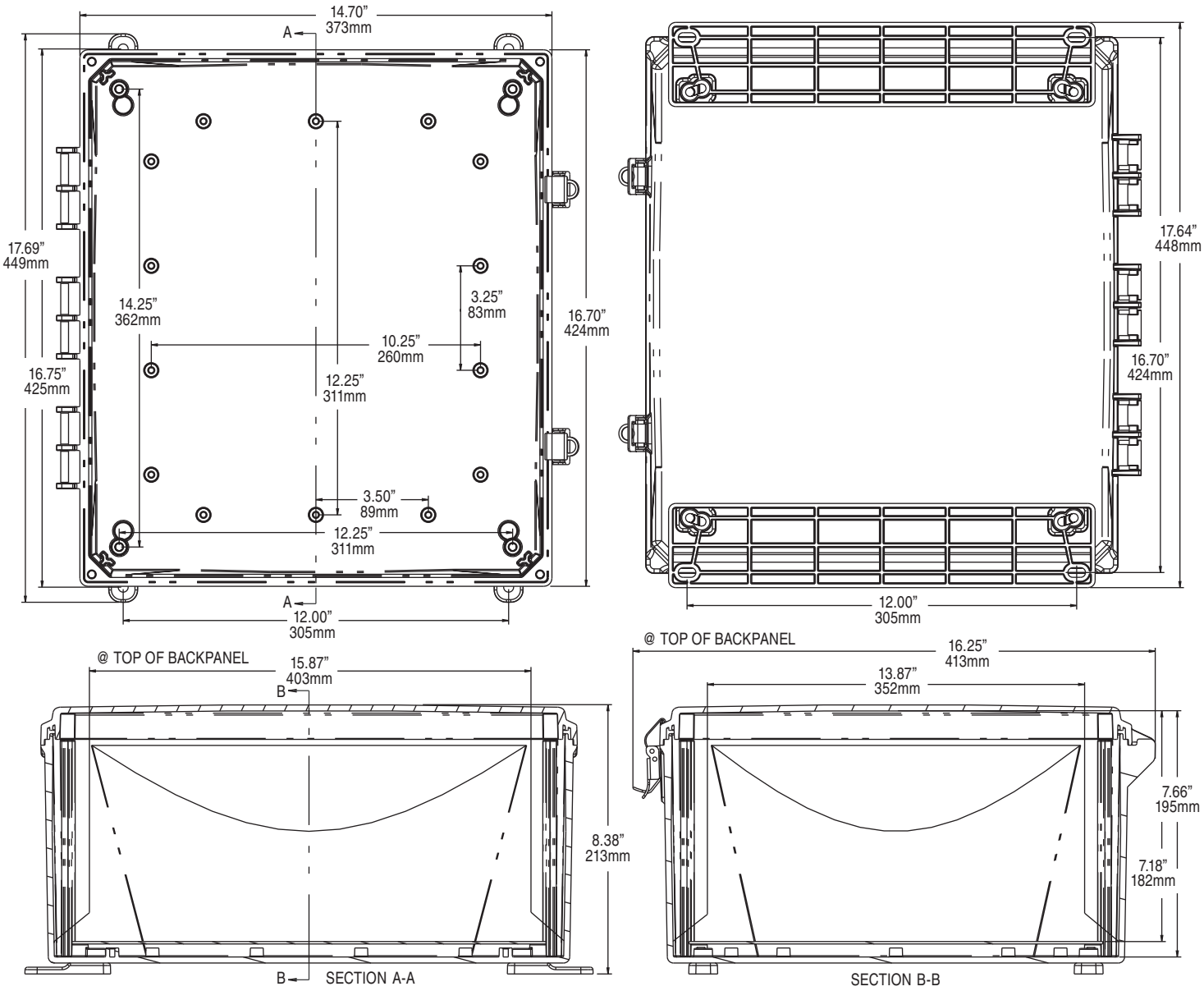
Our Premium Line enclosures are the most durable, non-metallic Nema UL rated enclosures available. From the extremely versatile mounting options inside the enclosure to having the most off-the-shelf accessories, the Integra "Made In the USA" Premium Line enclosures provide great value to any application.

Mechanical and Thermal	Test Spec.	Unit	Premium Line
Instrumented Dart Impact @ 73° F		in/lb.	565
Falling Ball Impact @ 73° F	UL-746	in/lb.	900
Deflection Temperature @ 264 psi	ASTM D648	Deg. F	270
Modulus of Elasticity	ASTM D790	ksi	340
Temperature Range		Deg. F	-40 to 265
Flammable / UV Ratings	**Test Spec.**	**Unit**	**Premium Line**
Flame Rating - UL	UL 94	-	5VA
Outdoor UV Exposure	UL	-	F1

Atex pending, contact factory for details

161407 P/N	4X IP66	6P IP68	Hinged Cover	Screw Cover	Opaque Cover	Clear Cover	Mounting Feet	Mounting Flange	Stainless Steel Locking Latch	Non-Metallic Locking Latch
H161407S	✓	✓		✓	✓		✓			
H161407SC	✓	✓		✓		✓	✓			
H161407SF	✓	✓		✓	✓			✓		
H161407SCF	✓	✓		✓		✓		✓		
H161407H	✓		✓	✓	✓		✓			
H161407HC	✓		✓	✓		✓	✓			
H161407HF	✓		✓	✓	✓			✓		
H161407HCF	✓		✓	✓		✓		✓		
H161407HLL	✓		✓		✓		✓		✓	
H161407HCLL	✓		✓			✓	✓		✓	
H161407HFLL	✓		✓		✓			✓	✓	
H161407HCFLL	✓		✓			✓		✓	✓	
H161407HNL	✓		✓		✓		✓			✓
H161407HCNL	✓		✓			✓	✓			✓
H161407HFNL	✓		✓		✓			✓		✓
H161407HCFNL	✓		✓			✓		✓		✓
H161407H-6P	✓	✓	✓	✓	✓		✓			
H161407HC-6P	✓	✓	✓	✓		✓	✓			
H161407HF-6P	✓	✓	✓	✓	✓			✓		
H161407HCF-6P	✓	✓	✓	✓		✓		✓		

TORQUE SPECIFICATIONS - Mounting Brackets - 1/4"-20 x 0.25 SS, countersunk phillips drive screws (torque limit = 20 in. lbs.) | **Covers / Doors** - Torque for corner screws is 10 in. lbs.



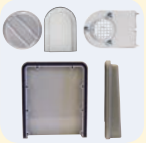
Register online to download this drawing off the Integra website at www.integraenclosures.com | Your company's logo or other information on the lid. Consult factory for details.

Accessories for 16x14x7 (For complete accessories, see page 49-52)

Back Panels
ABP1614 - Aluminum panel
SBP1614 - Steel panel
PVCBP1614 - PVC panel

Aluminum Swing Out Panels
ABP-1614USP/USOPK - Complete panel kit
ABP-1614USP - Aluminum swing out panels only
USOPK - Hardware only

Back Panel Adjustment Kit
BPAKG - Gray, Set Screw
BPAKB - Black, Set Screw
UBPAKG - Gray, Thumb Screw
UBPAKB - Black Thumb Screw



Air Vents / Fan Shrouds
VENT 3 - 3" Aluminum louvered
VENT 2 - Outdoor labyrinth
FS KIT1 - 1 piece kit
FS KIT2 - 2 piece kit
Specifications on page 47

Steel Swing Out Panels
SBP-1614USP/USOPK - Complete panel kit
SBP-1614USP - Steel swing out panels only
USOPK - Hardware only

Cord Grips
IP68/NEMA 4X/6P rated
See page 53 for more details and part numbers.

Din Rail
DIN 14 - 2 rails, 4 screws

Pole Mounting Kit
PMKG-214 - 2" pole
PMKG-314 - 3" pole
PMKG-414 - 4" pole
PMKG-1214 - 12" pole

Mounting Feet & Flange Kits
MFKG - Premium line feet
MFKSS - Stainless steel feet
MFLK14 - 14" Flange kit

Vapor Guardian 5500®

Dynamic Controls and Remote Management

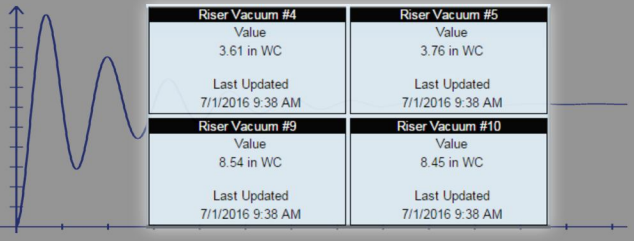
Backed by 30 Years of Mitigation Experience

Key Features

+ Save up to 90% on power consumption
+ Remotely manage 10 dynamically controlled blower systems
+ Remotely control sub-slab pressures to tolerance of 0.001 ”w.c.
+ Remotely monitor up to 45 additional performance metrics
+ Login and view system performance in real-time
+ Automated Email and text alerts
+ Automated quarterly and annual performance reports

Specification

Outputs to Control Blowers	10	Height	11.8"
Inputs for Sensors	45	Length	11.8"
Sensor Input Voltage	0-5V, 0-10V	Width	5.2"
RS485 Port for Modbus Comm.	1		
Powered by	120VAC or 24VDC		



www.vapordynamics.com · (908) 362-7291

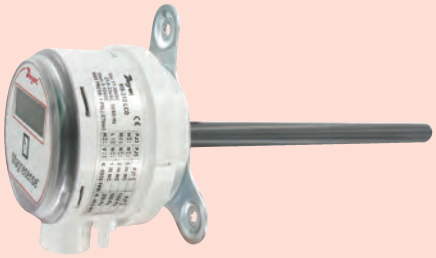
Series MS

Magnesense® Differential Pressure Transmitter

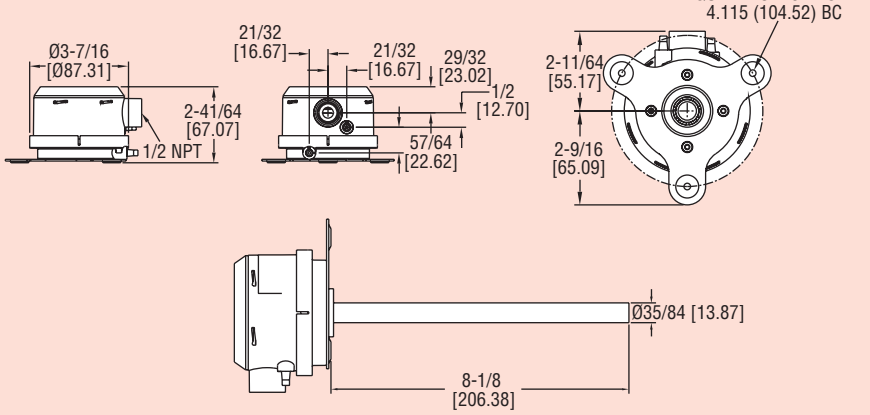
Monitors Pressure & Air Velocity

CE

Standard MS with optional LCD



MS with optional LCD and static probe



The Series MS Magnesense® Differential Pressure Transmitter is an extremely versatile transmitter for monitoring pressure and air velocity. This compact package is loaded with features such as:

- Field selectable English or Metric ranges
- Field upgradeable LCD display
- Adjustable damping of output signal (with optional display)
- Ability to select a square root output for use with pitot tubes and other similar flow sensors

Along with these features, the patented magnetic sensing technology provides exceptional long term performance and enables the Magnesense® Differential Pressure Transmitter to be the single solution for your pressure and flow applications.

Model	Output	Selectable Ranges
MS-121*	4-20 mA	0.1″, 0.25″, 0.5″ w.c. (25, 50, 100 Pa)
MS-321*	0-10 V	0.1″, 0.25″, 0.5″ w.c. (25, 50, 100 Pa)
MS-721*	0-5 V	0.1″, 0.25″, 0.5″ w.c. (25, 50, 100 Pa)
MS-111*	4-20 mA	1″, 2″, 5″ w.c. (250, 500, 1250 Pa)
MS-311*	0-10 V	1″, 2″, 5″ w.c. (250, 500, 1250 Pa)
MS-711*	0-5 V	1″, 2″, 5″ w.c. (250, 500, 1250 Pa)
MS-131	4-20 mA	10″ w.c. (2 kPa)
MS-141	4-20 mA	15″ w.c. (3 kPa)
MS-151	4-20 mA	25″ w.c. (5 kPa)
MS-331	0-10 V	10″ w.c. (2 kPa)
MS-341	0-10 V	15″ w.c. (3 kPa)
MS-351	0-10 V	25″ w.c. (5 kPa)
MS-021	4-20 mA	±0.1″, 0.25″,0.5″ w.c. (±25, 50, 100 Pa)
MS-221	0-10 V	±0.1″, 0.25″,0.5″ w.c. (±25, 50, 100 Pa)
MS-621	0-5 V	±0.1″, 0.25″,0.5″ w.c. (±25, 50, 100 Pa)

OPTIONS

Note: Add -LCD to end of model for units with display.
*Models available with duct mount static pressure probe. Change last digit from 1 to 2. Ex. MS-122

Add suffix -NIST to end of model numbers for NIST traceable calibration certificate. Example: MS-021-NIST.

Add suffix -FC to end of model numbers for factory calibration certificate. Example: MS-021-FC.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: ±1% for 0.25″ (50 Pa), 0.5″ (100 Pa), 2″ (500 Pa), 5″ (1250 Pa), 10″ (2 kPa), 15″ (3 kPa), 25″ (5 kPa) ±2% for 0.1″ (25 Pa), 1″ (250 Pa) and all bi-directional ranges.
Stability: ±1% / year FSO.
Temperature Limits: 0 to 150°F (-18 to 66°C).
Pressure Limits: 1 psi maximum, operation; 10 psi, burst.
Power Requirements: 10 to 35 VDC (2-wire); 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).
Output Signals: 4 to 20 mA (2-wire); 0 to 5 V, 0 to 10 V (3-wire).
Response Time: Adjustable 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.
Zero & Span Adjustments: Digital push button.
Loop Resistance: Current output: 0-1250 Ω max; Voltage output: min. load resistance 1 kΩ.
Current Consumption: 40 mA max.
Display (optional): 4 digit LCD.
Electrical Connections:
4-20 mA, 2-Wire: European style terminal block for 16 to 26 AWG.
0-10 V, 3-Wire: European style terminal block for 16 to 22 AWG.
Electrical Entry: 1/2″ NPS thread.
Accessory (A-151): Cable gland for 5 to 10 mm diameter cable.
Process Connections: 3/16″ ID tubing (5 mm ID). Maximum OD 9 mm.
Enclosure Rating: NEMA 4X (IP66).
Mounting Orientation: Diaphragm in vertical position.
Weight: 8.0 oz (230 g).
Agency Approvals: CE.

ACCESSORIES

A-435, Field Upgradeable LCD
A-480, Plastic Static Pressure Tip
A-481, Installer kit. Includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-489, 4″ Straight Static Pressure Tip with Flange
A-302F-A, 303 SS Static Pressure Tip with mounting flange. For 3/16″ ID rubber or plastic tubing. 4″ insertion depth. Includes mounting screws
SCD-PS, 100 to 240 VAC/VDC to 24 VDC Power Supply

See page 567 for process tubing options.

CLEAN VAPOR LLC
V.O.C. & RADON PLAN DESIGN AND REMEDIATION

July 17, 2018

Ms. Liz Porter, PG, PMP
Senior Project Manager/Vice President
S&ME
6515 Nightingale Lane
Knoxville, TN 37909

RE: Vapor Intrusion Mitigation System Installation
Former Sanitary Laundry, 625 N. Broadway, Knoxville, Tennessee

Dear Ms. Porter,

Clean Vapor, LLC is pleased to respond to your request to install a vapor intrusion mitigation system located at 625 N. Broadway, Knoxville, Tennessee. Our price quote is to facilitate and install the mitigation system as shown in the July 13, 2018, Vapor Intrusion Mitigation Plan Design prepared by Clean Vapor. The price is inclusive of all work specified including labor, materials, travel, electric, sub contract roofing and preparing the commissioning report. The cost of the installation of the remote management system and one year of electronic monitoring is included. S&ME will provide testing and disposal of sub slab soil tailings. The time required to install and commission this system is estimated to be two to three weeks. We have not yet secured a price on the city permits and this cost has been estimated at $ 500.00.

Cost to Install Vapor Intrusion Mitigation System: $ 127,300.00

To be provided by others prior to the start of work:

- An energized electric panel to power the blowers and monitoring system
- Running water
- Contact information for the roofing company that holds the current warranty

TERMS OF PAYMENT:

NET 30 DAYS. THE MOBILIZATION AND INITIAL MATERIALS PAYMENT (25%) WILL BE INVOICED UPON SIGNING THE AGREEMENT AND WILL BE DUE AT THE OUTSET OF THE PROJECT. ALL DESIGNS AND PREVIOUS INVOICES MUST BE PAID IN FULL PRIOR TO THE START OF WORK. THE REMAINING BALANCE WILL BE BILLED ACCORDING TO A SCHEDULE OF VALUES. PAYMENTS SHALL BE PAID WITHIN 30 DAYS OF EACH INVOICE. EXTENDED TERMS BEYOND 30 DAYS WILL INCREASE THE COST OF QUOTED SERVICES BY 0.06 PERCENT PER DAY OR BY 1.8 PERCENT PER MONTH.

ACCEPTANCE OF AGREEMENT:

When you return this proposal with your signature, it shall constitute a contract for performance of work.

Contract submitted for Clean Vapor LLC by:

Prepared by: _____ Date: _____
Hatton, for CLEAN VAPOR, LLC

Accepted by: _____ Date:_____
Porter, for S&ME

INVOICE

INITIAL ESTIMATE WHEN FULL SYSTEM WAS EVALUATED

APPLICATION FOR PAYMENT

From:	To:	Project:	Application No.:
Clean Vapor, LLC P.O. Box 688 Blairstown, NJ 07825	S&ME 6515 Nightingail Lane Knoxville,TN 37909	Former Sanitary Laundry Knoxville, TN	**Invoice No:** Invoice Date: Period From: Period To: Project / Contract No:

Remit Payment to above Address

Payment Terms: Due on Receipt Contract For: Vapor Intrusion Piping Contract Date:

CONTRACTOR'S APPLICATION FOR PAYMENT

1. ORIGINAL CONTRACT SUM		$ 127,300.00
2. Net Change By Change Orders		
3. CONTRACT SUM TO DATE		$ 127,300.00
4. TOTAL COMPLETED AND STORED TO DATE		
5. RETAINAGE		
a. 0% of Completed Work		
b. 0% of Stored Material		
Total Retainage		
6. TOTAL EARNED LESS RETAINAGE		
7. LESS PREVIOUS PAYMENT(S) Line #6		
8. CURRENT PAYMENT DUE		
9. BALANCE TO FINISH, INCLUDING RETAINAGE		

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total of Previous Approved Changes		
Total Approved Changes This Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned certifies that to the best of his/her knowledge, information and belief the work covered by this invoice has been completed in accordance with the contract documents, that all amounts have been paid for Work for which previous invoice(s) were issued and payments received, and that current payment shown herein is now due.

By: *Thomas E. Hatton* Date: 7/20/2018

State of: County of:

Subscribed and sworn to before me this day of

Notary Public: Commision Expires:

INVOICE

SCHEDULE OF VALUES

From:
Clean Vapor, LLC
P.O. Box 688
Blairstown, NJ 07825

To:
S&ME
6515 Nightingail Lane
Knoxville,TN 37909

Project:
Former Sanitary Laundry
Knoxville, TN

Application No.:
Invoice No:
Period From:
Period To:
Project / Contract No:

A	B	C	D	E	F	G		H	I
Item #	Description of Work	Scheduled Value	Work Completed		Materials Presently Stored	Total Completed & Stored To Date	%	Balance To Finish	Retainage
			From Previous Application(s)	This Period					
1	Mobilization and initial Materials	$ 23,000.00				$ -	0%		$ -
2	Suction Point and Soil Excavation	$ 13,210.00				$ -	0%	$ -	$ -
3	Risers, Piping, Core Cutting, etc.	$ 15,090.00				$ -	0%		$ -
4	Sealing	$ 4,200.00				$ -	0%		$ -
5	Balancing Valves	$ 1,700.00				$ -	0%		$ -
6	Safety Plan	$ 2,400.00				$ -	0%		$ -
7	Vacuum Guages	$ 1,600.00				$ -	0%		$ -
8	Blowers and Stands	$ 9,200.00				$ -	0%		$ -
9	Motor Controls & Monitoring	$ 12,900.00				$ -	0%		$ -
10	Start up and Balance	$ 2,600.00				$ -	0%		$ -
11	Overhead Piping	$ 16,700.00				$ -	0%		$ -
12	Safety Expendables	$ 1,200.00				$ -	0%		$ -
13	Electric & Permits	$ 9,300.00				$ -	0%		$ -
14	Sensor Ports and Embedded Probes	$ 3,000.00				$ -	0%		$ -
15	Roof Coring and Sealing	$ 1,600.00				$ -	0%		$ -
16	Final Report	$ 3,000.00				$ -	0%		$ -
17	Electric Metering	$ 1,800.00				$ -	0%		$ -
18	Demobilzation	$ 4,800.00				$ -	0%		$ -
19						$ -	0%	$ -	$ -
20						$ -	0%	$ -	$ -
21						$ -	0%	$ -	$ -
22						$ -	0%	$ -	$ -
23						$ -	0%	$ -	$ -
24						$ -	0%	$ -	$ -
25						$ -	0%	$ -	$ -
26						$ -	0%	$ -	$ -
27						$ -	0%	$	$ -
28						$ -	0%	$	$ -
29						$ -	0%	$ -	$ -
	TOTAL:	**$ 127,300.00**	**$ -**		**$ -**	**$ -**	**0%**	**$ -**	**$ -**

UPDATED ESTIMATE WHEN PARTIAL SYSTEM WAS CONSIDERED

INVOICE

APPLICATION FOR PAYMENT

From:	To:	Project:	Application No.:
Clean Vapor, LLC	S&ME	Former Sanitary Laundry	**Invoice No:**
P.O. Box 688	6515 Nightingail Lane	625 N Broadway/750 Stone Street	Invoice Date:
Blairstown, NJ 07825	Knoxville,TN 37909	Knoxville, TN	Period From:
			Period To:
Remit Payment to above Address			Project / Contract No:
	Payment Terms: Due on Receipt	Contract For: Vapor Intrusion Piping	Contract Date:

CONTRACTOR'S APPLICATION FOR PAYMENT

1. ORIGINAL CONTRACT SUM		$ 127,300.00
2. Net Change By Change Orders		
3. CONTRACT SUM TO DATE		$ 127,300.00
4. TOTAL COMPLETED AND STORED TO DATE		
5. RETAINAGE		
a. 0% of Completed Work		
b. 0% of Stored Material		
Total Retainage		
6. TOTAL EARNED LESS RETAINAGE		
7. LESS PREVIOUS PAYMENT(S) Line #6		
8. CURRENT PAYMENT DUE		
9. BALANCE TO FINISH, INCLUDING RETAINAGE		

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total of Previous Approved Changes		
Total Approved Changes This Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned certifies that to the best of his/her knowledge, information and belief the work covered by this invoice has been completed in accordance with the contract documents, that all amounts have been paid for Work for which previous invoice(s) were issued and payments received, and that current payment shown herein is now due.

By: *Thomas E. Hatton* Date: 8/7/2019

State of: County of:

Subscribed and sworn to before me this day of

Notary Public: Commision Expires:

PARTIAL SYSTEM INSTALLATION FEES

SCHEDULE OF VALUES

INVOICE

From:
Clean Vapor, LLC
P.O. Box 688
Blairstown, NJ 07825

To:
S&ME
6515 Nightingail Lane
Knoxville,TN 37909

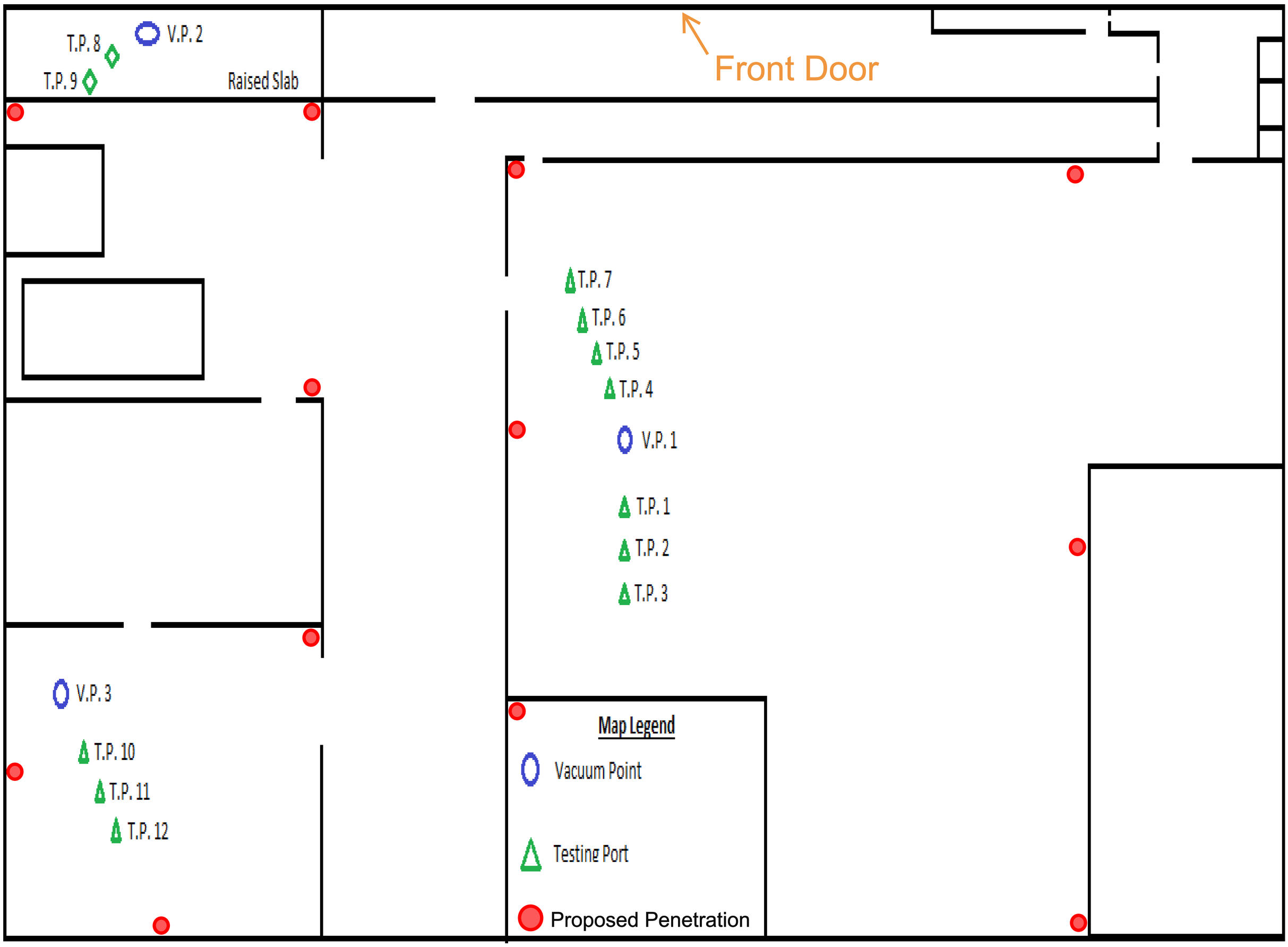
Project:
Former Sanitary Laundry
625 N Broadway/750 Stone Street
Knoxville, TN

Application No.:
Invoice No:
Period From:
Period To:
Project / Contract No:

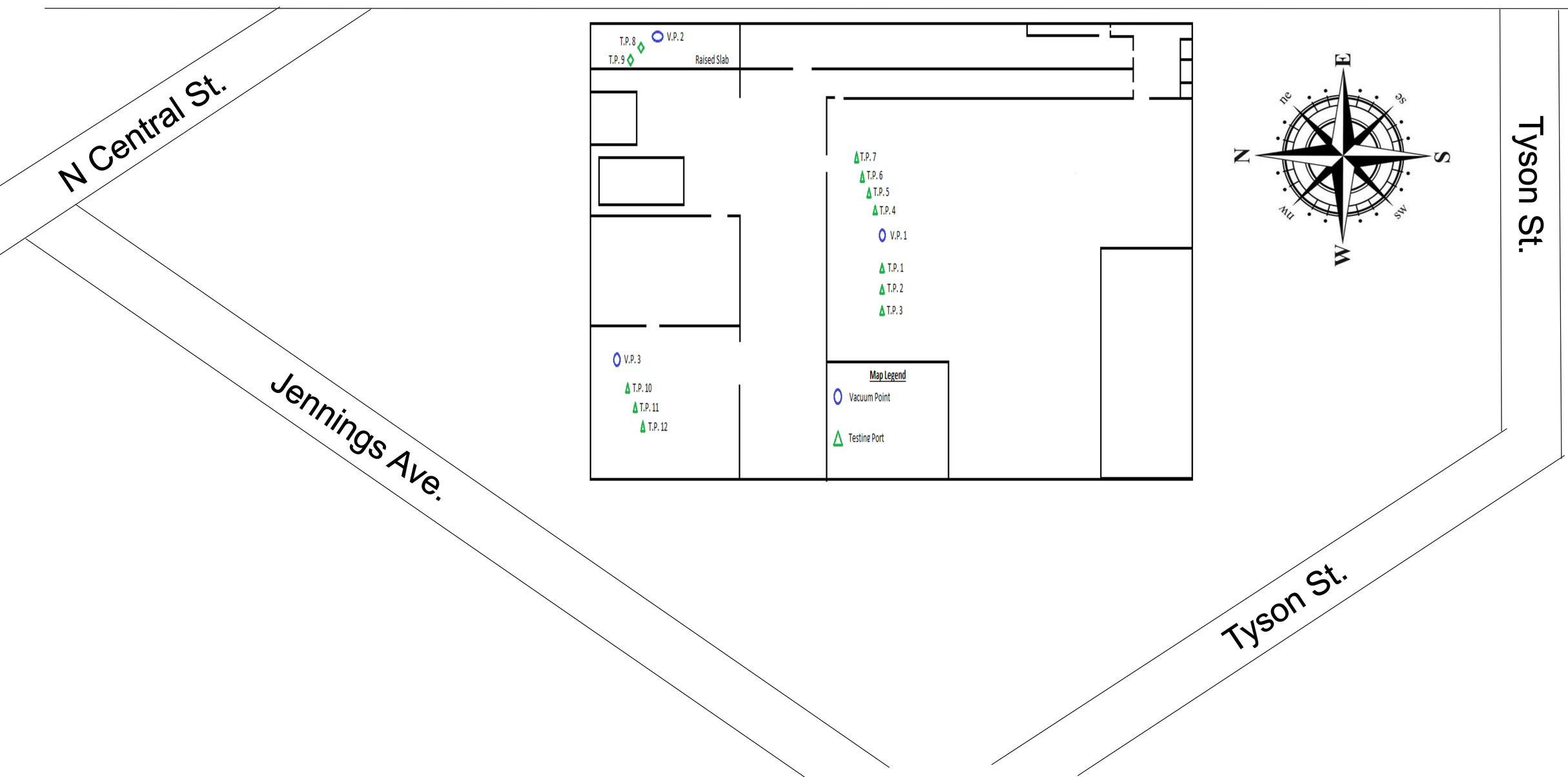
A	B	C	D	E	F	G		H	I
Item #	Description of Work	Scheduled Value	Work Completed		Materials Presently Stored	Total Completed & Stored To Date	%	Balance To Finish	Retainage
			From Previous Application(s)	This Period					
1	Mobilization and initial Materials	$ 23,000.00	$ 13,050.00			$ 13,050.00	57%	$ 9,950.00	$ -
2	Suction Point and Soil Excavation	$ 13,210.00	$ 13,210.00			$ 13,210.00	100%	$ -	$ -
3	Risers, Piping, Core Cutting, etc.	$ 15,090.00	$ 15,090.00			$ 15,090.00	100%	$ -	$ -
4	Sealing	$ 4,200.00				$ -	0%	$ 4,200.00	$ -
5	Balancing Valves	$ 1,700.00	$ 1,700.00			$ 1,700.00	100%	$ -	$ -
6	Safety Plan	$ 2,400.00	$ 1,200.00			$ 1,200.00	50%	$ 1,200.00	$ -
7	Vacuum Guages	$ 1,600.00				$ -	0%	$ 1,600.00	$ -
8	Blowers and Stands	$ 9,200.00				$ -	0%	$ 9,200.00	$ -
9	Motor Controls & Monitoring	$ 12,900.00				$ -	0%	$ 12,900.00	$ -
10	Start up and Balance	$ 2,600.00				$ -	0%	$ 2,600.00	$ -
11	Overhead Piping	$ 16,700.00				$ -	0%	$ 16,700.00	$ -
12	Safety Expendables	$ 1,200.00	$ 600.00			$ 600.00	50%	$ 600.00	$ -
13	Electric & Permits	$ 9,300.00				$ -	0%	$ 9,300.00	$ -
14	Sensor Ports and Embedded Probes	$ 3,000.00				$ -	0%	$ 3,000.00	$ -
15	Roof Coring and Sealing	$ 1,600.00				$ -	0%	$ 1,600.00	$ -
16	Final Report	$ 3,000.00				$ -	0%	$ 3,000.00	$ -
17	Electric Metering	$ 1,800.00				$ -	0%	$ 1,800.00	$ -
18	Demobilzation	$ 4,800.00	$ 2,400.00			$ 2,400.00	50%	$ 2,400.00	$ -
19	Equipment/Jobsite Utilities		$ 2,450.00						
20									
21									
22									
23									
24		**Total Risers Only**	$ 49,700.00						
	TOTAL:	**$ 127,300.00**			**$ -**	**$ 47,250.00**	**0%**	**$ 80,050.00**	**$ -**

NASHVILLE 615-988-1515 * KNOXVILLE 865-245-4515 * CHATTANOOGA 423-790-0368

625 North Broadway Knoxville, TN 37917



N Broadway



*NASHVILLE 615-988-1515 *KNOXVILLE 865-245-4515 *CHATTANOOGA 423-790-0368

Communication Test

625 North Broadway

Knoxville, TN 37917

	Testing Port	Open Inches W.C.	With Choke (10") Inches W.C.	With Choke (5") Inches W.C.
Main Slab	T.P. # 1	-0.053		
	T.P. # 2	0.000		
	T.P. # 3	0.000		
	T.P. # 4	-0.020		
	T.P. # 5	0.000		
	T.P. # 6	0.000		
	T.P. # 7	0.000		
Raised Slab	T.P. # 8	-0.011		
	T.P. # 9	0.000		
Basement	T.P. # 10	-0.117	-0.057	-0.005
	T.P. # 11	-0.158	-0.076	-0.034
	T.P. # 12	-0.079	-0.042	-0.007

ESTIMATE

Radon 1

1905 21st Ave. South
Nashville, Tennessee 37212
615-988-1515

TOTAL **$36,000.00**

Liz Porter
625 North Broadway
Knoxville, TN
37917

Estimate#	EST-000026
Estimate Date	Thursday, November 29, 2018

#	ITEM & DESCRIPTION	AMOUNT
1	Passive Sub-Slab Vent System Achieving communication was a struggle at this site. Obstacles such as cork composites underneath the slabs, as well as penetrations and broken concrete, allowed PFE to diminish or added restrictions that cut off airflow. Little to no aggregate was found in many of the test locations. However, with a vacuum of 33 in.w.g, we could at least establish that a sub slab depressurization system is possible in most parts of the building. At this point, without power in the building, these systems are proposed as passive systems that can be activated at a future date. Each riser will consist of a 15-20 gallon pit of aggregate removed from the slab. SM&E shall supply barrels if contaminated material is to be contained upon removal. 4 inch schedule 40 PVC pipe will run from each extraction point, up the levels of structure, and through the roof. Roof penetrations will be sealed to prevent leaks.	$36,000.00 12.00 x 3,000.00

Does not include system activation.

Sub Total	36,000.00
Total	**$36,000.00**

Terms & Conditions

Payment is due upon completion of installation.

ESTIMATE

Radon One

1905 21st Ave. South
Nashville, Tennessee 37212
615-988-1515

TOTAL **$43,200.00**

Liz Porter
625 North Broadway
Knoxville, TN
37917

Estimate#	EST-000029
Estimate Date	Tuesday, December 04, 2018
Reference#	S&ME-625 North Broadway VOC

#	ITEM & DESCRIPTION	AMOUNT
1	Activation of Passive Sub-Slab Vent System If desired levels are not achieved with passive design, the system will be activated by installing multiple blowers to depressurize the sub-slab area. The blowers utilized will be explosion proof rated. Fans will be placed on the roof of the building at a safe distance away from any HVAC recovery air vents. New pressure field extension map will be drawn to show system pressure field changes. The current condition of concrete slab consists of unsealed penetrations and broken surface area which can cause fluctuations in PFE. As a result, the exact number and model of blowers will be confirmed after initial passive system installation, sealing of concrete slab, and additional testing.	$30,000.00 12.00 x 2,500.00
2	Central Alarm Board & OM&M A central alarm board with visual and audible alarms will be placed in a location agreed upon by contractor and owner. The alarms will sound when a riser fan loses power or drops below .25 in.w.g. An Operations Monitoring and Maintenance booklet will be placed at the alarm board.	$4,200.00 1.00 x 4,200.00
3	Electrical Work Electrical connections will be made by a licensed electrician provided by Radon 1.	$4,200.00 1.00 x 4,200.00
4	Vapor Pins Monitoring ports installed in the slab for future sampling of negative pressure field and contaminant levels.	$4,800.00 24.00 x 200.00

Sub Total	43,200.00
Total	**$43,200.00**

Terms & Conditions

Date: 1/14/2019

Photographer: Nathan Peterson

1	**Location / Orientation**	Central portion of basement
	Remarks	Clean Vapor crew drilling holes for system.

Date: 1/14/2019

Photographer: Nathan Peterson

2	**Location / Orientation**	Central portion of basement
	Remarks	Clean Vapor crew drilling holes for system

Date: 1/14/2019

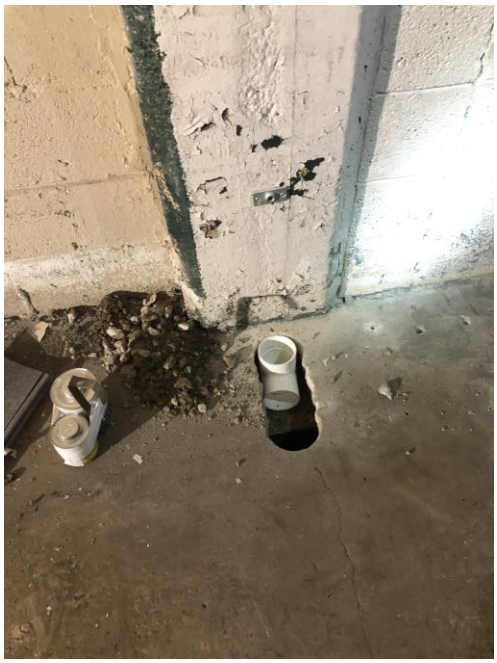
Photographer: Nathan Peterson

3	**Location / Orientation**	Central portion of basement
	Remarks	Hole in concrete at pillar to accommodate vent pipe.

Date: 8/12/2019

Photographer: Nathan Peterson

4	**Location / Orientation**	Central portion of basement
	Remarks	Removal of concrete and soil to accommodate vent pipe.



Date: 1/14/2019

Photographer: Nathan Peterson

5	**Location / Orientation**	Central portion of basement
	Remarks	Installing vent pipe in sub-slab.

Date: 1/14/2019

Photographer: Nathan Peterson

6	**Location / Orientation**	Central portion of basement
	Remarks	Vent pipe installed with riser along foundation pier.

Date: 1/14/2019

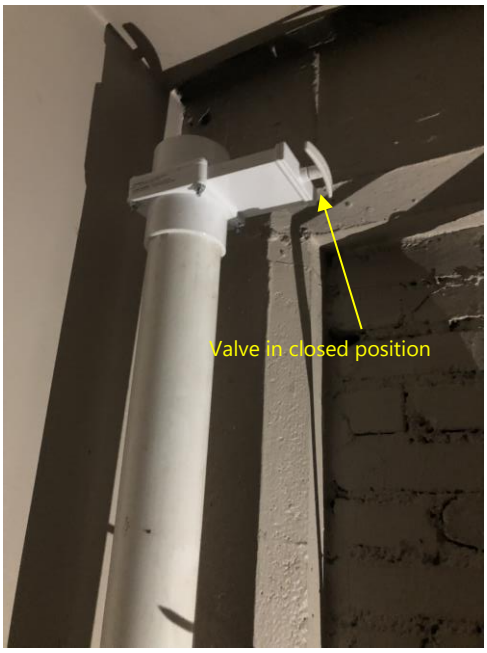
Photographer: Nathan Peterson

7	**Location / Orientation**	Basement of Sanitary Laundry facility.
	Remarks	Sealant application prior to cement placement.

Date: 1/14/2019

Photographer: Nathan Peterson

8	**Location / Orientation**	Northeast portion of basement.
	Remarks	Vent pipe installation surface completion with cement.



Date: 1/14/2019

Photographer: Nathan Peterson

9	**Remarks**	Completed vent pipe with valve at top of riser

Date: 1/14/2019

Photographer: Nathan Peterson

10	**Location / Orientation**	Near garage door in basement
	Remarks	Completed vent pipe with sample port, location label, and identification tag.

Appendix III – Draft Brownfield Agreement

STATE OF TENNESSEE

DEPARTMENT OF ENVIRONMENT AND CONSERVATION

DIVISION OF REMEDIATION

BROWNFIELD VOLUNTARY AGREEMENT

RE: Sanitary Laundry – 625 Broadway, Knoxville

SITE NUMBER: 47-545

INTRODUCTION

This Brownfield Voluntary Agreement (hereinafter "AGREEMENT") is made and entered into as of _____, 202_, by and between[among] the Tennessee Department of Environment and Conservation (hereinafter "Department"), and _____ , a _____ **[e.g., organized under and existing pursuant to the laws of the State of Tennessee]** (hereinafter [collectively] "Voluntary Party") for the purpose of addressing a 0.4 acre portion of the above-referenced site (hereinafter "Site"), which has the real or perceived threat of the presence on the Site of hazardous substances, solid waste, or any other pollutant.

Robert J. Martineau, Jr. is the duly appointed Commissioner of the Department. Robert A. Binford, Director of the Department's Remediation Division, has been delegated the authority to enter into these Agreements.

Pursuant to Tennessee Code Annotated § 68-212-224, the Commissioner is authorized to enter into an Agreement with a party who is willing and able to conduct an investigation and remediation of a hazardous substance site or Brownfields Project and who did not generate, transport or release the contamination that is to be addressed at the Site.

REQUIREMENTS

A. SITE LOCATION

The Site is located at 625 Broadway, Knoxville, Knox County, Tennessee and is shown in Exhibit A. The Site is approximately 0.4 acres in size and has a Knox County Parcel

Identification of Parcel 094DP013. A legal description of this tract is contained in Deed Book _____ Page _____ and is attached hereto as Exhibit B.

B. ELIGIBILITY

As required by T.C.A. § 68-212-224, a summary description of all known existing environmental investigations, studies, reports or documents concerning the Site's environmental condition has been submitted to the Department by the Voluntary Party.(A copy of the Summary is attached hereto as Exhibit C). On the date of entering into this AGREEMENT, the Department has determined that the Site is not listed or been proposed for listing on the federal National Priorities List by the United States Environmental Protection Agency (EPA). By entering into this AGREEMENT, the Voluntary Party certifies to the best of the Voluntary Party's knowledge that the Voluntary Party did not generate, transport or release contamination that is to be addressed at this site.

A. FINANCIAL REQUIREMENTS

Tennessee Code Annotated § 68-212-224 requires consideration of a fee to enroll in the Voluntary Cleanup Oversight and Assistance Program. The Commissioner has determined that a fee of three thousand dollars ($ 3,000.00) DOLLARS is appropriate for the Site. This payment must accompany this AGREEMENT when it is signed on behalf of the Voluntary Party and returned to the Department. The Commissioner has set the following schedule of additional fees that apply to all sites working in cooperation with the Department to recover the expense of oversight. These fees are in place of hourly time charges and normal travel costs during the first 150 hours of oversight for the project.

Program Entry	$ 750
Site Characterization	$ 2,000
Remediation	$ 2,500
Risk Assessment	$ 2,000
Site Specific Ground Water Classification	$ 2,000
Remedy Requirement Institutional Controls	$ 500
Annual O&M Review	$ 500

In addition to the fees identified previously, an annual longevity fee of $3,000 will be charged to the Site on the anniversary of the date the site entered the program until a letter requiring no further action has been issued or this AGREEMENT has been terminated.

Upon reaching 150 hours of oversight, the Site will be charged the current hourly rate (e.g. seventy-five dollars ($75.00) per hour for FY 2009-2010) per hour of oversight in addition to the fee schedule listed above. This amount includes the current hourly rate and pro rata portion of benefits for the Department's employees actively employed in oversight of work under this AGREEMENT, including preparation for and attendance at meetings, mileage, and the current State overhead rate. Additionally, any out-of-pocket expense, mileage, lab expense and costs including the State's current overhead rate, costs billed by State contractor(s) who are actively performing oversight or other unusual costs to the Department shall be billed to and paid by the Voluntary Party.

Fees must be paid to remain in the Voluntary Cleanup Oversight and Assistance Program and to receive a letter of no further action under Section H of this AGREEMENT.

D. IDENTIFICATION AND DOCUMENTATION OF CLEANUP

Based on the information submitted to the Department by or behalf of the Voluntary Party, and the Department's own review and investigation of the Site, the Parties hereto agree that the following environmental conditions are to be addressed under this AGREEMENT:

Sanitary Laundry and Dry Cleaning Company operated a dry cleaning facility at the site for approximately 60 years in the 1900's. During this time, petroleum products and dry cleaning fluids were stored in aboveground storage tanks, underground storage tanks, and drums. These materials were actively used for dry cleaning, laundry, and delivery vehicle fuel supply during the time of operation.

Investigation in 1993 indicated surface soil and groundwater on the Site were contaminated with hazardous substances including, but not limited to, petroleum hydrocarbons and chlorinated solvents. Impacts were the result of leaks from storage tanks and drums, as well

as, spills resulting from improper material handling. Two underground storage tanks used for petroleum products were subsequently removed in 1993.

The Site was added to the List of Inactive Hazardous Substance Sites by action of the Tennessee Solid Waste Disposal Control Board in 1994 and became Site #47-545, Sanitary Laundry and Dry Cleaners. TDEC initiated an emergency removal action in 1994 that containerized and disposed of the contents of an underground storage tank and two barrels of dry cleaning fluid, one of which was leaking. The underground storage tank contained fluid primarily consisting of water with trace levels of benzene, trichloroethene, and other hydrocarbons. A Notice of a Hazardous Substance Site was filed with the Knox County Register's Office on the Site in 1997. An Imminent, Substantial Danger Memorandum was issued by the Commissioner in 1999 due to the presence of multiple fifty-five (55) gallon drums of hazardous substances on the site. Access at the time was uncontrolled and there existed the potential for explosion and/or fire. TDEC initiated an emergency removal of the drums in October 1999.

The City of Knoxville, through an EPA Brownfields Assessment Grant (BF-95443509-1) completed additional investigation of the Site. The results of this study show there to be a continued presence of hazardous substances in the groundwater, soil, and air that include, but are not limited to, petroleum hydrocarbons and chlorinated solvents. Tetrachloroethylene and trichloroethylene were observed in the soil gas below the building with a maximum concentration of 68,000 $\mu g/m^3$ and 10,000 $\mu g/m^3$, respectively. These constituents also exceeded the EPA Regional Screening Levels for industrial facilities in the ambient air within the structure; a maximum concentration of tetrachloroethylene in ambient air was observed at 46 $\mu g/m^3$ and trichloroethylene at 6.4 $\mu g/m^3$.

E. AGREED LIABILITY RELIEF

T.C.A. § 68-212-224(a)(5) provides that, TDEC is authorized to limit the liability of a participant in a voluntary agreement or consent order entered into pursuant to T.C.A. § 68-212224. Such voluntary agreement or consent order may limit the liability of such participant to the obligations set forth therein and exempt the participant from any further liability under any

statute administered by TDEC for investigation, remediation, monitoring, and/or maintenance of contamination identified and addressed in the voluntary agreement or consent order. TDEC may extend this liability protection to successors in interest or in title to the participant, contractors conducting response actions at the Site, developers, future owners, tenants, and lenders, fiduciaries or insurers (collectively "Successor Parties").

In accordance with the above referenced authority, TDEC agrees that other than with respect to the obligations set forth in this AGREEMENT, the Voluntary Party and Successor Parties (as hereinafter defined) shall bear no liability to the State of Tennessee under any statute administered by the Department for investigation, remediation, monitoring, treatment and/or maintenance of contamination identified in and addressed in this AGREEMENT (collectively referred to as the "*Matters Addressed in this Agreement*"); provided, however, that to the extent that the Voluntary Party or Successor Parties (as hereinafter defined) has or maintains an interest in the Site, or possesses and/or controls all or a portion of the Site, its liability protections hereunder are contingent upon its continued adherence and enforcement of any land use restrictions imposed pursuant to or as a result of this AGREEMENT, adherence to the soil management plan, and vapor mitigation system operation and maintenance described the Section H Agreed Actions to be Taken. Nothing in this AGREEMENT shall be construed as limiting the liability or potential liability of the Voluntary Party for contamination occurring after the effective date of this AGREEMENT. This liability protection and all other benefits conferred by this AGREEMENT are extended to all future "Successor Parties" conditioned upon performance of the obligations contained in this AGREEMENT, compliance with the Land Use Restrictions (hereinafter defined); provided and adherence to the soil management plan, and vapor mitigation system operation and maintenance described the Section H Agreed Actions to be Taken, that such liability protection to other persons does not apply to liability to the extent that such liability arose prior to the effective date of this AGREEMENT.

F. ADMINISTRATIVE SETTLEMENT; THIRD PARTY LIABILITY <u>(include first sentence below for inactive hazardous substance sites (including hazardous waste sites) only)</u>

This AGREEMENT also constitutes an administrative settlement for purposes of Section 113(f) of CERCLA, 42 U.S.C.§9613(f), pursuant to which the Voluntary Party and Successor

Parties (as hereinafter defined) have, as of the effective date of this AGREEMENT, resolved their liability to the State of Tennessee for *Matters Addressed in this Agreement*.

The Voluntary Party shall not be liable to third parties for contribution regarding *Matters Addressed in this Agreement*; provided that, the Voluntary Party gave the third party actual or constructive notice of this AGREEMENT, and the third party was given an actual or constructive opportunity to comment upon this AGREEMENT. The Voluntary Party has demonstrated to the Department that constructive notice was accomplished by publishing a summary of this AGREEMENT in the Knox News Sentinel at least thirty (30) days prior to the Effective Date of this AGREEMENT. Nothing in this AGREEMENT shall impair the rights of third parties with respect to tort liability claims for damage to person or property arising from the contamination addressed by the voluntary agreement.

G. LAND USE RESTRICTIONS

Upon acquiring the Site, the Voluntary Party agrees that said property will be restricted as follows:

1. Prior to any part of the Property being used for a residence, domicile, daycare, school, or church, the Grantor, its successors, and/or assigns must notify TDEC Division of Remediation and must demonstrate to the satisfaction of TDEC Division of Remediation that any such proposed use listed above will not pose a danger to public health, safety, or the environment.

2. Prior to the removal of soil from the Property, the Grantor, its successors, and/or assigns must notify TDEC Division of Remediation and must demonstrate to the satisfaction of TDEC Division of Remediation that any such proposed soil removal will not pose a danger to public health, safety, or the environment.

3. The Grantor, its successors, and/or assigns must notify TDEC Division of Remediation prior to any invasive activity on the Property including soil borings or potable groundwater wells. The Grantor, its successors, and/or assigns must demonstrate to the satisfaction of TDEC Division of Remediation, through sampling

and analysis approved by TDEC Division of Remediation, that any invasive activity will not pose a danger to public health, safety, or the environment.

4. Any new building construction on the property shall incorporate a vapor mitigation system designed to prevent subsurface vapor phase contamination from migrating into the structure at concentrations greater than applicable regulatory comparison criteria. Said vapor mitigation system plans shall be developed by a TDEC-approved remediation contractor and provided to the TDEC Division of Remediation for review prior to construction. After installation, the TDEC-approved contractor shall submit a written report to the TDEC Division of Remediation documenting how the system was installed, any deviations from the TDEC-reviewed plan, as built drawings, and an Operation and Maintenance Plan identifying continued care and operation and maintenance activities to be conducted to ensure the venting system is effective in preventing subsurface vapor phase contamination from migrating into the structure at concentrations greater than applicable screening levels.

5. The Grantor, its successors, and/or assigns shall be responsible for continued care, operation, and maintenance of the remedy. The Grantor, its successors, and/or assigns shall notify TDEC Division of Remediation in writing if the integrity of the remedy is compromised and take any steps necessary to eliminate the threat or potential threat to public health, safety, or the environment posed by the hazardous substance(s).

The Voluntary Party agrees that it will file any land use restriction identified by the Department as necessary for the safe use of the property in accordance with T.C.A. 68-212-225. Any Party receiving liability protection under this AGREEMENT that seeks approval for restricted uses or seeks to cancel or make a Restriction less stringent shall be responsible for any costs incurred by the Department in the review and oversight of work associated with the restriction modification. Upon filing, a copy of this notice shall be mailed to all local governments having jurisdiction over any part of the subject property.

H. AGREED ACTIONS TO BE TAKEN

1. The Voluntary Party agrees to send notification of this AGREEMENT by certified mail to all local governments having jurisdiction over any part of the subject property and to all owners of adjoining properties. The Voluntary Party shall provide adequate documentation to demonstrate that public notice has been accomplished.

2. The Voluntary Party agrees that criteria required in TCA 68-212-206(d) shall be used in determining containment and cleanup actions, including monitoring and maintenance options, to be followed under this Agreement.

3. The Voluntary Party agrees to equip all building structures with a vapor mitigation system designed to prevent subsurface vapor phase contamination from migrating into the structure at concentrations greater than applicable screening levels. The Voluntary Party will provide plans developed by a TDEC-approved remediation contractor for the vapor mitigation system to the Department for review prior to construction. Within 90 days following completion of the system, the Voluntary Party shall submit a written report documenting that the system was installed. The report shall include as-built drawings and an Operation and Maintenance Plan identifying activities that must be conducted to ensure the venting system is operated in an effective manner consistent with its design specifications.

4. The Voluntary Party agrees to prepare a Soil Management Plan for Department approval prior to the commencement of construction activities. The soil management plan will include, but not be limited to, characterization of any excavated materials, handling procedures to ensure that any offsite disposal of impacted media meets all State and Federal requirements, and, if needed, installation of a barrier or engineered cap. A Health and Safety Plan shall be submitted to the Department for review and comment.

5. The Voluntary Party agrees to perform the work set forth in the Soil Management Plan and the Voluntary Party shall submit a written report of its findings to the Department within 90 days of completion of such work. The report shall include, but not be limited to, as-built drawings, details of any capping, and waste manifests for

offsite disposal. The report shall also identify any areas where soil remains at the Site that must be managed in the future to protect human health, safety, or the environment and requirements for future soil management and maintenance of any covers or caps.

6. Upon completion of all tasks set forth in this AGREEMENT, the Department shall issue to the Voluntary Party a letter stating the requirements of this AGREEMENT have been fulfilled and no further action is required of the Voluntary Party concerning contamination identified and addressed in this AGREEMENT. Upon the request of the Voluntary Party from time to time, the Department shall issue an interim status letter identifying what specific obligations remain to achieve completion of the work under this AGREEMENT. Issuance of a no further action letter shall not relieve the Voluntary Party of any responsibilities for operation and maintenance activities or continued adherence to and enforcement of land use restrictions, if any, pursuant to T.C.A. § 68-212-225. The Department reserves the right to require additional action for contamination caused by the Voluntary Party occurring after the date of this AGREEMENT or for contamination not identified and addressed under this AGREEMENT, if any. Each Voluntary Party or successor in title to the Site shall be responsible for compliance with the requirements of this AGREEMENT during the period in which such person owns an interest in the Site, or possesses and/or controls all or a portion of the Site.

I. ADDITIONAL REQUIREMENTS

6. The Voluntary Party may request a time extension for any deadline included in this AGREEMENT prior to the deadline. The time extension may be granted through mutual consent for good cause shown.

7. The Voluntary Party shall be responsible for the following obligations during periods when it owns the Site:

(a) Comply with land use restrictions;

(b) Do not impede effectiveness or integrity of institutional controls;

(c) Provide cooperation, assistance and access;

(d) Whether or not permits are required for onsite cleanup activities, such activities shall meet the standards that would apply if such permits were required.

J. SITE ACCESS

During the effective period of this AGREEMENT, and until certification by the Department of completion of all activities under this AGREEMENT, the Department and its representatives or designees shall have access during normal business hours to the Site. Nothing herein shall limit or otherwise affect the Department's right of entry, pursuant to any applicable statute, regulation or permit. The Department and its representative shall comply with all reasonable health and safety plans published by the Voluntary Party or its contractor and used by Site personnel for the purpose of protecting life and property.

A. SUBMISSION OF INFORMATION, REPORTS, OR STUDIES

Any information, reports, or studies submitted under the terms of this AGREEMENT shall contain the following notarized statement:

"I certify under penalty of law, including but not limited to penalties for perjury, that the information contained in this document and on any attachment is true, accurate and complete to the best of my knowledge, information and belief. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for intentional violation."

B. RESERVATION OF RIGHTS

6. This AGREEMENT shall not be construed as waiving any right or authority available to the Commissioner to assess responsible parties other than the Voluntary Party for liability for civil penalties or damages incurred by the State, including any natural resource damage claims which the Department or the State of Tennessee may have under Section 107 of CERCLA or any other statute, rule, regulation or common law.

7. Nothing in this AGREEMENT shall be interpreted as limiting the Voluntary

Party's right to preserve the confidentiality of attorney work product or client-attorney communication. T.C.A. § 68-212-202 et seq. contains no provisions for confidentiality or proprietary information. Therefore, records, reports, test results, or other information submitted to the Department under this AGREEMENT shall be subject to public review. Any and all records, reports, test results or other information relating to a hazardous substance site or the possible hazardous substance at the Site submitted under this AGREEMENT may be used by the Department for all purposes set forth in T.C.A. § 68-212-201 et seq.

3. Voluntary Parties or Successor Parties may terminate this AGREEMENT as it pertains to them at any time upon written notice to the Department during the time period that they own the site and/or conduct operations at the site. Upon such termination, the Voluntary Party shall have no further obligations hereunder other than payment of oversight costs accrued to the date of notice of termination and adherence to any notice of land use controls filed under TCA 68-212-225; provided, that both Parties shall have and retain all authority, rights and defenses as if this AGREEMENT had never existed.

8. The Department may terminate this AGREEMENT by written notice to the Voluntary Party in the event that the Department receives timely comments from third-party contribution claim holders pursuant to the notice sent under Section F of this AGREEMENT, if any, and such comments disclose facts or considerations that indicate that this AGREEMENT is inappropriate, improper or inadequate; provided, however, absent fraud or intentional misconduct, that in such event the Voluntary Party may elect to waive the protections set forth in Section F hereunder and the remainder of the terms and conditions of this AGREEMENT shall continue to be in full force and effect. The Department's notice of termination must be made within thirty (30) days of the end of the 30-day notice period required by Section F. The Voluntary Party's waiver notice must be made within fifteen (15) days after receipt of the Department's termination notice.

9. The Department reserves the right to terminate this agreement if the Voluntary

Party fails to timely pay fees and other financial requirements specified in Section C Financial Requirements. For the purpose of this AGREEMENT, timely payment means the Department receiving payment from the Voluntary Party within 120 days of the first billing of a financial requirement or according to a payment plan agreed in writing between Voluntary Party and the Department.

6. If any provision of this AGREEMENT is held to be invalid or enforceable by a court of competent jurisdiction, then the remaining provisions of this AGREEMENT will remain in full force and effect.

10. Nothing in this AGREEMENT shall be interpreted as limiting the liability for the improper management and/or disposal of contaminated material removed from the site.

The individual(s) signing below on behalf of the Voluntary Party **[represent that they have the authority or are] [**represents that he is a] duly authorized agent(s), capable of entering into a binding AGREEMENT on behalf of the Voluntary Party. By entering into this AGREEMENT, [**these individuals certify**][this individual certifies] that the Voluntary Party did not generate or did not cause to generate, transport or release contamination that is to be addressed at this site.

The Effective Date of this AGREEMENT is the thirtieth (30th) day after the publication of the notice described in Section F of this AGREEMENT.

_____	_____	_____	_____
Date	Robert A. Binford Program Administrator Division of Remediation	Date	Voluntary Party:

Appendix IV – NEO Asbestos Abatement Final Submittal

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal
NEO Corporation Project #: 7-30043-07

NEO
CORPORATION

NEO CORPORATION
289 Silkwood Drive, Canton, North Carolina 28716
Environmental, Industrial and Demolition Services

January 8, 2018

S&ME Inc.
Ms. Liz Porter
1413 Topside Road
Louisville, Tennessee 377777

RE: City of Knoxville
Asbestos Abatement Final Submittal
NEO Corporation Project #: 7-30043-07

Dear Ms. Porter:

Attached please find a copy of the asbestos abatement final submittal for the above referenced project.

Should you have questions or require additional information, please contact me at 828-456-4332. NEO Corporation is pleased to provide quality environmental maintenance services to the City of Knoxville.

Sincerely,

NEO Corporation

Lauren Armeni

Lauren Armeni
Compliance Administrator

File: 7-30043-07

NEO CORPORATION

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

KNOX COUNTY
DEPARTMENT OF AIR QUALITY MANAGEMENT

ASBESTOS DEMOLITION/RENOVATION PERMIT

PERMIT NO: KCA17040
Issued: 24 OCTOBER 2017

CONTRACTOR NAME: NEO Corporation

MAILING ADDRESS: 289 Silkwood Drive
Canton, North Carolina 28716

CONTACT: Candice Lance PHONE: (828) 456-4332

NAME/LOCATION OF PROJECT: City Laundry Building
625 North Broadway
Knoxville, TN 37917

DEMOLITION: NO

REMOVAL: YES

DATES OF REMOVAL: 10/20/2017 TO 11/15/2017 12/18/17 to 12/31/17
DATES OF DEMOLITION: TO

Approved:

Asbestos Present? YES

RACM? YES
If yes, describe and list amounts: 895 LF TSI, 400 SF Wrap

Nonfriable Category I to be removed? NO
If yes, describe and list amounts:

Nonfriable Category II to be removed? YES
If yes, describe and list amounts: 1,665 SF Floor Tile, 800 SF Ceiling Cork Board

Nonfriable Category I not to be removed? NO
If yes, describe and list amounts:

Nonfriable Category II not to be removed? NO
If yes, describe and list amounts:

Permit must be available on project site at all times.

(865) 215-5900 ● 140 Dameron Avenue, Knoxville, TN 37917 ● (865) 215-5902 (Fax)

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

NEO Corporation

Daily Log/Time Sheet

7-30043-07

JOB#: 7-30043-07	DATE: 12-18-17	SUPERVISOR: Mike Robinson	
JOB NAME: City of Knoxville Smith	JOB LOCATION: Knoxville		DAY: Mon

TYPE OF WORK / CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor + Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. [redacted]	7:00	11:30	12:00	5:30	10		7	100	
2. [redacted]							[redacted]	[redacted]	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job site setup. neg air prep
Removal of Mastic on top floor underneg pressure
with wet Method Double bag took Bags to Dumpster
HepA vac and secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043.07	DATE: 12-18-17	SUPERVISOR: Mike Robinson
JOB NAME: Sfme City of Knox.	JOB LOCATION: Knoxville	DAY: Mon

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yicmara Estrada	7:00	11:30	12	5:30	10		7	200	
2. Gilliam Hernandez	7:00	11:30	12	5:30	10		7	200	
3. Esdras Lopez	7:00	11:30	12	5:30	10		7	200	
4. Francisco Merino	7:00	11:30	12	5:30	10		7	200	
5. Herson Garcia	7:00	11:30	12	5:30	10		7	200	
6.									
7.									
8.									
9.									
10.									
11.									
12.					50				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-18-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: Knoxville	DAY: Mon

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Jose Qubon	7:00	11:30	12:00	5:30	10		7	200	
2. Milton Cruz	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Cumberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-18-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: Knoxville	DAY: Mon

TYPE OF WORK / CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12:00	5:30	10		7	200	
2. Michel Rodriguez	7:00	11:30	12:00	5:30	10		7	200	✓
3. Luis Del Llano Sr	7:00	11:30	12:00	5:30	10		7	200	✓
4. Luis Del Llano JR	7:00	11:30	12:00	5:30	10		7	200	✓
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					40				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Daily Log/Time Sheet

7-30043-07

JOB#: 7-30043-07	DATE: 12-19-17	SUPERVISOR: Mike Robinson
JOB NAME: Same	JOB LOCATION: 625 W. Broadway	DAY: Tues

TYPE OF WORK / CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor/worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1.	7:00	11:30	12:00	5:30	10		7	100	
2. Scott Daulton	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job Site Removal of 4 pipe flanges on 1st floor and Removal of TSI from Basement Fine Cleaned Hepa Vac Underneg pressure with wet Method Double Bag tool Bags to Dumpster and secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-19-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: Knoxville	DAY: Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Jose Dubon	7:00	11:30	12	5:30	10		7	200	
2. Milton Cruz	7:00	11:30	12	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-19-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: Knoxville	DAY: Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS (E) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Ramiro Estrada	7:00	11:30	12:00	5:30	10		7	200	
2. William Hernandez	7:00	11:30	12:00	5:30	10		7	200	
3. Esdras Lopez	7:00	11:30	12:00	5:30	10		7	200	
4. Francisco Merino	7:00	11:30	12:00	5:30	10		7	200	
5. Herson Garcia	7:00	11:30	12:00	5:30	10		7	200	
6.									
7.									
8.									
9.									
10.									
11.									
12.					50				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation Cumberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-19-17	SUPERVISOR: Mike Robinson
JOB NAME: Some City of Knox	JOB LOCATION: Knoxville	DAY: Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12	5:30	10		7	200	
3. Leyda Ransvary	7:00	11:30	12	5:30	10		7	200	
4. Michel Rodriguez	7:00	11:30	12	5:30	10		7	200	—
5. Luis Del Llano JR	7:00	11:30	12	5:30	10		7	200	—
6. Luis Del Llano JR	7:00	11:30	12	5:30	10		7	200	—
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (~~No~~) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-20-17	SUPERVISOR: Mike Robinson
JOB NAME: Stme	JOB LOCATION: Knoxville	DAY: Wed

TYPE OF WORK / CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Matt	7:00	11:30	12:00	5:30	10		7	100	
2. Scott Smith	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job site Removal of TSI on North side under Neg pressure with wet Method Double Bag took Bags to Dumpster Fine Cleaned Hepa Vac and Secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-20-17	SUPERVISOR: Mike Robinson	
JOB NAME: Stme City of Knox	JOB LOCATION: Knoxville		DAY: WED

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Ramon Estrada	7:00	11:30	12	5:30	10		7	200	
2. William Hinandez	7:00	11:30	12	5:30	10		7	200	
3. Esdras Lopez	7:00	11:30	12	5:30	10		7	200	
4. Herson Garcia	7:00	11:30	12	5:30	10		7	200	
5. Francisco Merino	7:00	11:30	12	5:30	10		7	200	
6.									
7.									
8.									
9.									
10.									
11.									
12.					50				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-20-17	SUPERVISOR: Mike Robinson
JOB NAME: State City of Knox	JOB LOCATION: Knoxville	DAY: Wed

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Jose Dubon	7:00	11:30	12:00	5:30	10		7	200	
2. Mitton Cruz	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Cumberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-20-17	SUPERVISOR: Mike Robinson
JOB NAME: State City of Knox	JOB LOCATION: Knoxville	DAY: Wed

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12	5:30	10		7	200	
3. Leyda Ransuary	7:00	11:30	12	5:30	10		7	200	
4. Luis Del Llano SR.	7:00	11:30	12	5:30	10		7	200	✓
5. Luis Del Llano JR.	7:00	11:30	12	5:30	10		7	200	✓
6. Michel Rodriguez	7:00	11:30	12	5:30	10		7	200	✓
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1.

2.

3.

4.

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-300 43-07	DATE: 12-21-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone	JOB LOCATION: 625 N Broadway	DAY: Thurs

TYPE OF WORK / CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor/worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. MR	7:00	11:30	12:00	5:30	10		7	100	
2. [redacted]									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job Site Removal of Asbestos tar on Ceilings Panels under neg pressure with wet Method Double Bag took Bags to Dumpster Pine cleaned HepA Vac and secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-21-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: Knoxville	DAY: THURS

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Jose Dubon	7:00	11:30	12:00	5:30	10		7	200	
2. Milton Cruz	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-21-17	SUPERVISOR: Mike Robinson
JOB NAME: Sirme City of Knox	JOB LOCATION: Knoxville	DAY: Thurs.

TYPE OF WORK / CIRCLE ONE ASBESTOS (R) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yiomara Estrada	7:00	11:30	12	5:30	10		7	200	
2. William Hernandez	7:00	11:30	12	5:30	10		7	200	
3. Esdras Lopez	7:00	11:30	12	5:30	10		7	200	
4. Francisco Menio	7:00	11:30	12	5:30	10		7	200	
5. Herson Garcia	7:00	11:30	12	5:30	10		7	200	
6.									
7.									
8.									
9.									
10.									
11.									
12.					50				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation Cumberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-21-17	SUPERVISOR: Mike Robinson
JOB NAME: Some City of Knox	JOB LOCATION: Knoxville	DAY: Thurs.

TYPE OF WORK / CIRCLE ONE ASBESTOS (E) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica ortiz	7:00	11:30	12	5:30	10		7	200	
2. Michel Rodriguez	7:00	11:30	12	5:30	10		7	200	—
3. Luis Del Llano SR	7:00	11:30	12	5:30	10		7	200	—
4. Luis Del Llano JR.	7:00	11:30	12	5:30	10		7	200	—
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					40				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-26-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone (City of Knox.)	JOB LOCATION: 625 N Broadway	DAY: ~~Wed~~ Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. [signature]	7:00	11:30	12:00	5:30	10		7	100	
2. [signature]	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job site Removal of TSI on south end underpass pressure with wet Method Double bag Hook Bags in Dumpster fine cleaned HepA Vac and Secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7.300 43-07	DATE: 12-26-17	SUPERVISOR: Mike Robinson
JOB NAME: Sme (City of Knox)	JOB LOCATION: 625 N Broadway	DAY: Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Xiomara Estrada	7:00	11:30	12	5:30	10		7		
2. Jose Dubon	7:00	11:30	12	5:30	10		7		
3. William Herandez	7:00	11:30	12	5:30	10		7		
4. [redacted]									
5. Francisco Merino	7:00	11:30	12	5:30	10		7		
6. Herson Garcia	7:00	11:30	12	5:30	10		7		
7. Esdras lopez	7:00	11:30	12	5:30	10		7		
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-26-17	SUPERVISOR: Mike Robinson
JOB NAME: State (City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Tues.

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Milton Cruz	7:00	11:30	12:00	5:30	10		7	200	
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

Cumberland

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-26-17	SUPERVISOR: Mike Robinson
JOB NAME: Some(City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Tues

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12:00	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12:00	5:30	10		7	200	
3. Loyda Ramsey	7:00	11:30	12:00	5:30	10		7	200	
4. Luis Del Llano SR.	7:00	11:30	12:00	5:30	10		7	200	
5. Luis Del Llano JR.	7:00	11:30	12:00	5:30	10		7	200	
6. Michle Rodriguez	7:00	11:30	12:00	5:30	10		7	200	
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-300473-07	DATE: 12-27-17	SUPERVISOR: Mike Robinson
JOB NAME: State (City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Wed

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. MA	7:00	11:30	12:00	5:30	10		7	100	
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job Site Removal of Asbestos on Boiler Double Bag took Bags to Dumpster under Neg pressure with wet Method Fire cleaned and secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation

CRM

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-27-17	SUPERVISOR: Mike Robinson
JOB NAME: SAME - Knoxville	JOB LOCATION: Broadway	DAY: Wed

TYPE OF WORK /CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: F

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee #	Dept Code	Phase Code	Per Diem
1. Francisco Meriano	7	11:30	12	5:30	10		7		
2. Herson Garcia	7	11:30	12	5:30	10		7		
3. Esdras Lopez	7	11:30	12	5:30	10		7		
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					36				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name/Company**

1. 3.

2. 4.

NEO Corporation

Cumberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-27-17	SUPERVISOR: Mike Robinson
JOB NAME: Stme (City of Knox)	JOB LOCATION: 625 N Broadway	DAY: Wed

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role:

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12:00	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12:00	5:30	10		7	200	
3. Leyda Ransvary	7:00	11:30	12:00	5:30	10		7	200	
4. Michel Rodriguez	7:00	11:30	12:00	5:30	10		7	200	
5. Luis Del Llano JR	7:00	11:30	12:00	5:30	10		7	200	
6. Luis Del Llano SR.	7:00	11:30	12:00	5:30	10		7	200	
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Daily Log/Time Sheet

7-30043-07

JOB#: 7-30043-07	DATE: 12-28-17	SUPERVISOR: Mike Robinson
JOB NAME: St Me (City of Knox	JOB LOCATION: 625 N Broadway	DAY: THURS

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role:

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. [signature]	7:00	11:30	12:00	5:30	10		7	100	
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to job Site Removal of TSI under neg pressure with wet Method Double Bag put Bags into Dumpster fine cleaned HepA vac & secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-28-17	SUPERVISOR: Mike Robinson
JOB NAME: SME Knoxville	JOB LOCATION: Broadway	DAY: Thur

TYPE OF WORK /CIRCLE ONE (ASBESTOS) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: F

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee #	Dept Code	Phase Code	Per Diem
1. Francisco Merino	7	11 30	12	5 30	10		7	200	
2. Herson Garcia	7	11 30	12	5 30	10		7	200	
3. Esdras Lopez	7	11 30	12	5 30	10		7	200	
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					30				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name/Company**

1. 3.

2. 4.

Cumberland

NEO Corporation

Daily Log/Time Sheet

JOB#: 2-30043-07	DATE: 12-28-17	SUPERVISOR: Mike Robinson
JOB NAME: Stone City of Knox	JOB LOCATION: 625 N. Broadway	DAY: THURS

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12:00	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12:00	5:30	10		7	200	
3. Leyda Ransuary	7:00	11:30	12:00	5:30	10		7	200	
4. Luis Del Llano SR.	7:00	11:30	12:00	5:30	10		7	200	
5. Luis Del Llano JR.	7:00	11:30	12:00	5:30	10		7	200	
6. Michel Rodriguez	7:00	11:30	12:00	5:30	10		7	200	
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company **Name Company**

1. 3.

2. 4.

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-29-17	SUPERVISOR: Mike Robinson
JOB NAME: Some (City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Fri

TYPE OF WORK / CIRCLE ONE ASBESTOS (F) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Supervisor

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1.	7:00	11:30	12:00	5:30	10		7	100	
2. Scott Swanton	7:00	11:30	12:00	5:30	10		7	200	
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					20				

Summary of Work Completed Today/Special Events/Etc.

Mobilized to jobsite Removal of TSI under neg. pressure with wet Method Double Bag Fine Cleaned HepaVac & Secured area

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-29-17	SUPERVISOR: Mike Robinson
JOB NAME: Stme (City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Fri.

TYPE OF WORK / CIRCLE ONE ASBESTOS (E) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Jose Dubon	7:00	11:30	12	5:30	10		7	200	
2. Yomara Estrado	7:00	11:30	12	5:30	10		7	200	
3. Francisco Merino	7:00	11:30	12	5:30	10		7	200	
4. Herson Garcia	7:00	11:30	12	5:30	10		7	200	
5. Esdras Lopez	7:00	11:30	12	5:30	10		7	200	
6. Jilliam Hernandez	7:00	11:30	12	5:30	10		7	200	
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

CRM

NEO Corporation

Daily Log/Time Sheet

JOB#: 7-30093-07	DATE: 12-29-17	SUPERVISOR: Mike Robinson
JOB NAME: Sme (City of Knox	JOB LOCATION: 625 N. Broadway	DAY: Fri.

TYPE OF WORK / CIRCLE ONE ASBESTOS INSULATION LEAD INDUSTRIAL CONSULTING (Demo)

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Milton Cruz	7:00	11:30	12:00	5:30	10		7	200	
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.					10				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

NEO Corporation Comberland

Daily Log/Time Sheet

JOB#: 7-30043-07	DATE: 12-29-17	SUPERVISOR: Mike Robinson
JOB NAME: Stme(City of Knox)	JOB LOCATION: 625 N. Broadway	DAY: Fri

TYPE OF WORK / CIRCLE ONE ASBESTOS (E) INSULATION LEAD INDUSTRIAL CONSULTING

Employee Role: Worker

EMPLOYEE NAME	IN	OUT	IN	OUT	# of Hours	Employee#	Dept Code	Phase Code	Per Diem
1. Yessica Ortiz	7:00	11:30	12	5:30	10		7	200	
2. Manuel Cruz	7:00	11:30	12	5:30	10		7	200	
3. Leyda Ransuary	7:00	11:30	12	5:30	10		7	200	
4. Michel Rodriguez	7:00	11:30	12	5:30	10		7	200	
5. Luis Del Llano SR.	7:00	11:30	12	5:30	10		7	200	
6. Luis Del Llano JR.	7:00	11:30	12	5:30	10		7	200	
7.									
8.									
9.									
10.									
11.									
12.					60				

Summary of Work Completed Today/Special Events/Etc.

Accidents Today? (circle one) Yes (No) **If yes, explain above**

Visitors Today

Name/Company	Name Company
1.	3.
2.	4.

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

NEO CORPORATION

Environmental Services Division

ASBESTOS MONITORING DATA

Location: 625 N. Broadway Knoxville TN

Date: 12-18-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Yessica Ortiz SS#: 3393

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P100

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI, Floor tile & Mastic

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Yessica Ortiz Luis del Llano Sr., Luis del Llano JR., Herson Garcia

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		703	7:00	7:30	30	60	3	0.045
2.0	2.0		704	7:30	5:30	600	1200	3	0.022
			TWA = 0.006			f/cc			

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI & floor tile under neg pressure with wet Method

All samples taken in Direct Breathing Zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N Broadway Knoxville TN

Date: 12-19-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Manuel Cruz

SS#: 6143

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE:

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI, floor tile & Mastic

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Scott Trentham Yessica Ortiz, Manuel Cruz, Leyda Ramsury

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 1/min, after 2.0 1/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDXII

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		705	7:00	7:30	30	60	3	0.045
2.0	2.0		706	7:30	5:30	600	1200	3	0.0022
			TWA = 0.006 f/cc						

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of floor tile on 1st floor Bathrooms & TSI in Basement on Northeast side Double bag Under neg pressure with wet Method

All samples taken in Direct Breathing Zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N. Broadway Knoxville TN

Date: 12-20-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Manuel Cruz

SS#: 6143

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P100

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI + floor tile

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Scott Trentham Jessica Ortiz, Manuel Cruz, Ceyda Ransway

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 605 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		707	7:00	7:30	30	60	3	0.045
2.0	2.0		708	7:30	5:30	600	1200	3	0.0022
			TWA = 0.006 f/cc						

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI on Southwest side under low pressure with wet Method

All Samples taken in Direct Breathing Zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N Broadway Knoxville TN

Date: 12-21-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Yessicaortiz

SS#: 3393

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P100

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinsia, Yessicaortiz Francisco Manio, Luis Del Llano SR. Luis Del Llano SR.

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		709	7:00	7:30	30	60	3	0.045
2.0	2.0		710	7:30	5:30	600	1200	3	0.0022
			TWA=	0.006	f/cc				

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of Transit Doors & TSI Under Vac pressure with wet Method

All Sample taken in Direct Breathing zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

Airborne Fiber Analysis

By Phase Contrast Microscopy
NIOSH 7400, Issue 2, (A Counting Rules)

Customer: NEO Corporation
289 Silkwood Dr.
Canton, NC 28716

Attn: Lauren Armeni

Project: 7-30043-07

Lab Order ID: 1727493
Analysis ID: 1727493_PCM
Date Received: 12/27/2017
Date Reported: 12/29/2017

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Volume / *Filter Area*	Fibers / Fields	Filter (Fibers / mm²)	LOD (Fibers / cc)	Conc. (Fibers / cc)
703 / *1727493PCM_1*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
704 / *1727493PCM_2*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
705 / *1727493PCM_3*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
706 / *1727493PCM_4*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
707 / *1727493PCM_5*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
708 / *1727493PCM_6*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
709 / *1727493PCM_7*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
710 / *1727493PCM_8*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**

Bart Huber (8)
Analyst

Approved Signatory

Scientific Analytical Institute
302-L Pomona Dr. Greensboro, NC 27407
Phone: 336.292.3888 Fax: 336.292.3313
www.sailab.com lab@sailab.com

Lab Use Only
Lab Order ID: 1727493
Client Code: NEO01

Company Contact Information	
Company: NEO Corporation	Contact: Lauren Armeni
Address: 289 Silkwood Dr.	Phone ☐: 828-456-4332
Canton, NC 28716	Fax ☐: 828-456-4216
	Email ☑: Larmeni@neocorporation

Billing/Invoice Information	Turn Around Times	
Company:	90 Min. ☐	48 Hours ☑
Contact:	3 Hours ☐	72 Hours ☐
Address:	6 Hours ☐	96 Hours ☐
	12 Hours ☐	120 Hours ☐
	24 Hours ☐	144 Hours ☐

PO Number: 14818
Project Name/Number: 7-30043-07

Asbestos Test Types	
PLM EPA 600/R-93/116	☐
Positive stop ☐	
PLM Point Count	☐
PCM NIOSH 7400	☑
TEM AHERA	☐
TEM Level II	☐
TEM NIOSH 7402	☐
TEM Bulk Qualitative	☐
TEM Bulk Chatfield	☐
TEM Bulk Quantitative	☐
TEM Wipe ASTM D6480-99	☐
TEM Microvac ASTM D5755-02	☐
TEM Water EPA 100.2	☐
Other:	☐

Sample ID #	Description/Location	Volume/Area	Comments
703	Breathing Zone	60	
704		1200	
705		60	
706		1200	
707		60	
708		1200	
709		60	
710		1200	

Accepted ☑
Rejected ☐

Total # of Samples 8

Relinquished by	Date/Time	Received by	Date/Time
Lauren Armeni	12/26/17	[illegible]	12/27/17 11AM

Page 1 of 1

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 629 N Broadway Knoxville Tn

Date: 12-26-17

Job #: 7-30093

Supv: Mike Robinson

[x] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Yessica Ortiz

SS#: 3393

RESPIRATOR: [ ] no, [ ] ½-face, [x] full-face, [ ] supplied-air TYPE: P-100

DISPOSABLE COVERALLS: [ ] no, [x] yes OTHER:

WORK or AREA MONITORED: TSI

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Scott Trentham, Yessica Ortiz, Manuel Cruz, Leyda Ramsery

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		711	7:00	7:30	30	60	3	0.045
2.0	2.0		712	7:30	5:30	600	1200	3	0.0022
			TWA=	0.006 f/cc					

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI under Neg pressure with wet Method Double Bag fine cleaned HepA Vac and secured area

All samples taken in Direct Breathing zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N Broadway Knoxville TN

Date: 12-27-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Manuel Cruz SS#: 6143

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P100

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Jessica Ortiz, Manuel Cruz, Leyda Ransvary

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		713	7:00	7:30	30	60	3	0.045
2.0	2.0		714	7:30	5:30	600	1200	3	0.002
			TWA= 0.006 f/cc						

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI under negative pressure with wet Method Double bag fine cleaned HepaVac and Secured area

All samples taken in Direct Breathing Zone of worker

Signature:

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N. Broadway Knoxville TN

Date: 12-28-17

Job #: 7-3009 3-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Manuel Cruz SS#: 6143

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P-100

DISPOSABLE COVERALLS: [ ] no, [ ] yes OTHER:

WORK or AREA MONITORED: TSI

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Yessica Ortiz Manuel Cruz, Leyda Ransaury, Luis Del Llano

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 1/min, after 2.0 1/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		715	7:00	7:30	30	60	3	0.045
2.0	2.0		716	7:30	5:30	600	1200	3	0.002
			TWA= 0.006 f/cc						

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI Fire asbestos Doors, floor tile & Mastic under NEG pressure with wet Method Double bag Fine Cleaned Hepa Vac & Secured area

All samples taken in Direct Breathing Zone of worker

Signature: MR

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

NEO CORPORATION

ASBESTOS MONITORING DATA

Environmental Services Division

Location: 625 N. Broadway Knoxville TN

Date: 12-29-17

Job #: 7-30043-07

Supv: Mike Robinson

[✓] PERSONAL, [ ] AREA, [ ] CLEARANCE SAMPLES

EMPLOYEE'S NAME: Yessica Ortiz

SS#: 3393

RESPIRATOR: [ ] no, [ ] ½-face, [✓] full-face, [ ] supplied-air TYPE: P100

DISPOSABLE COVERALLS: [ ] no, [✓] yes OTHER:

WORK or AREA MONITORED: TSI

WORK/AREAS/EMPLOYEES REPRESENTED: Mike Robinson, Yessica Ortiz Manuel Cruz, Ceyda Ransveny.

CALIBRATION (with filter in-line):

[ ] Rotameter s/n: 805 [ ] Electronic bubble meter s/n:

FLOW RATE before 2.0 l/min, after 2.0 l/min (use lower flow rate to calculate volume)

SAMPLING PUMP:

Type: BDX II

s/n: 2075

Mixed cellulose ester membrane filters were used in inverted open-face 25-mm cassettes with 50-mm extension cowls. Samples were collected and analyzed in accordance with the OSHA Reference Method (personal samples) or NIOSH Method 7400 (area samples).

Flow Rate Before	Flow Rate After	Laboratory Number	Sample Number	Start Time	Stop Time	Sample Time	Sample Volume	Activity	Result fibers/cc
2.0	2.0		718	7:00	7:30	30	60	3	0.045
2.0	2.0		719	7:30	5:30	600	1200	3	0.0022
			TWA = 0.0006 f/cc						

WORK HISTORY/REMARKS/AREA SAMPLE PLACEMENT: Removal of TSI under Neg pressure with wet Method Double Bag Fine Cleaned HepA vac and Secured area

All Samples Taken in Direct Breathing Zone of worker

Signature: [signature]

Analyst/Laboratory:

NEO Analyst Page Number:

AMD 1.1 (3/30/90)

1. Site Preparation 2. Removal, nonfriable ACM 3. Removal, architectural finish or fireproofing 4. Removal, pipe/fitting insulation
5. Removal, boiler/tank insulation 6. Encapsulation of pipe or boiler insulation 7. Gross debris clean-up 8. Fine cleaning
9. Cleaning critical barrier 10. Removing decontamination unit 11. Loading bags 12. Disposal at landfill

WHITE - Personnel File YELLOW - Job File PINK - Supervisor

Airborne Fiber Analysis

By Phase Contrast Microscopy
NIOSH 7400, Issue 2, (A Counting Rules)

Customer: NEO Corporation
289 Silkwood Dr.
Canton, NC 28716

Attn: Lauren Armeni

Lab Order ID: 1800070
Analysis ID: 1800070_PCM
Date Received: 1/3/2018
Date Reported: 1/4/2018

Project: 7-30043-07

Sample ID / *Lab Sample ID*	Description / *Lab Notes*	Volume / *Filter Area*	Fibers / Fields	Filter (Fibers / mm²)	LOD (Fibers / cc)	Conc. (Fibers / cc)
711 / *1800070PCM_1*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
712 / *1800070PCM_2*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
713 / *1800070PCM_3*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
714 / *1800070PCM_4*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
715 / *1800070PCM_5*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
716 / *1800070PCM_6*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**
718 / *1800070PCM_7*	Breathing zone	60 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.045	**< 0.045**
719 / *1800070PCM_8*	Breathing zone	1200 L / *385 mm 2*	< 5.5 / 100	< 7.0	0.0022	**< 0.0022**

Sharon Donald (8)
Analyst

Approved Signatory

Scientific Analytical Institute
302-L Pomona Dr. Greensboro, NC 27407
Phone: 336.292.3888 Fax: 336.292.3313
www.sailab.com lab@sailab.com

Lab Use Only
Lab Order ID: 1800070
Client Code: NEO01

Company Contact Information	
Company: NEO Corporation	Contact: Lauren Armeni
Address: 289 Silkwood Dr.	Phone ☐: 828-456-4332
Canton, NC 28716	Fax ☐: 828-456-4216
	Email ☑: Larmeni@neocorporation

Billing/Invoice Information	Turn Around Times	
Company:	90 Min. ☐	48 Hours ☑
Contact:	3 Hours ☐	72 Hours ☐
Address:	6 Hours ☐	96 Hours ☐
	12 Hours ☐	120 Hours ☐
	24 Hours ☐	144 Hours ☐

Asbestos Test Types	
PLM EPA 600/R-93/116	☐
Positive stop ☐	
PLM Point Count	☐
PCM NIOSH 7400	☑
TEM AHERA	☐
TEM Level II	☐
TEM NIOSH 7402	☐
TEM Bulk Qualitative	☐
TEM Bulk Chatfield	☐
TEM Bulk Quantitative	☐
TEM Wipe ASTM D6480-99	☐
TEM Microvac ASTM D5755-02	☐
TEM Water EPA 100.2	☐
Other:	☐

PO Number: 14826
Project Name/Number: 7-30043-07

Sample ID #	Description/Location	Volume/Area	Comments
711	Breathing Zone	60	
712		1200	
713		60	
714		1200	
715		60	
716		1200	
718		60	
719		1200	

Accepted ☑
Rejected ☐

Total # of Samples 8

Relinquished by	Date/Time	Received by	Date/Time
Lauren Armeni	1-2-18	P Hulley 1/3	930A

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

NON-HAZARDOUS SPECIAL WASTE & ASBESTOS MANIFEST

If waste is asbestos waste, complete Sections I, II, III and IV.
If waste is NOT asbestos waste, complete only Sections I, II and III.

No. 065293

Section I GENERATOR (Generator complete all of Section 1)

a. Generator Name: City of Knoxville
b. Generating Location:
c. Address: 625 N. Broadway Knoxville TN 37917
d. Address:
e. Phone No.:
f. Phone No.:

If owner of the generating facility differs from the generator, provide:

g. Owner's Name:
Owner's Phone No.:

I. WCI WASTE CODE: MBL 17-057
Containers

j. Description of Waste : TSI

k. Quantity: Units: No.: TYPE: BA

TYPE
DM - METAL DRUM
DP - PLASTIC DRUM
B - BAG
BA - 6 MIL PLASTIC BAG OR WRAP
T - TRUCK
O - OTHER

UNITS
P - POUNDS
Y - YARDS
M^3 - CUBIC METERS
Y^3 - CUBIC YARDS
O - OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Mike Robinson — Generator Authorized Agent Name
Signature
12/8/17 — Shipment Date

Section II TRANSPORTER (Generator complete a-d; Transporter I complete e-g; Transporter II complete h-n)

TRANSPORTER I

a.Name: Neo
b. Address: 289 Silkwood Dr Canton NC
c. Driver Name / Title: Mike Robinson (Supervisor) (Print / Type)
d. Phone No.: 8657766885 e. Truck No.:
f. Vehicle License No. / State: NC

Acknowledgement of Receipt of Materials.
g. Driver's Signature
12/8/17 — Shipment Date

TRANSPORTER II

h.Name: Waste Connections
i. Address: Chipman St Knoxville, TN
j. Driver Name / Title: Derek Bays (PRINT / TYPE)
k. Phone No.: l. Truck No.:
m. Vehicle License No. / State: TN

Acknowledgement of Receipt of Materials.
n. Driver's Signature
12/8/17 — Shipment Date

Section III DESTINATION (Generator complete a-d, destination site completes e-f.)

a.Site Name: MBL
b. Physical Address: 233 CR 166 Athens TN 37303
c. Phone No.:
d. Mailing Address:

e. Discrepancy Indication Space:

I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

f. Name of Authorized Agent
Signature
Receipt Date 12/8/17

Section IV ASBESTOS (Generator completes a-d, f, g; Operator * completes e.)

a. Operator's * Name: Neo Corporation
b. Operator's * Phone No.:
c. Operator's * Address 289 Silkwood Dr Canton NC
d. Special handling instructions and additional information:

OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations

e. Operator's Name & Title: Mike Robinson (Supervisor) (Print / Type)
Operator's * Signature
12/8/17 — Date

f. Name & address of Responsible Agency:

g. ☒ Friable; ☐ Non-friable; ☐ Both _____ % friable _____ % nonfriable _____

* Operator refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

DESTINATION RETAIN

NON-HAZARDOUS SPECIAL WASTE & ASBESTOS MANIFEST

No. 065294

If waste is asbestos waste, complete Sections I, II, III and IV.
If waste is NOT asbestos waste, complete only Sections I, II and III.

Section I GENERATOR (Generator complete all of Section I)

a. Generator Name: City of Knoxville
b. Generating Location:
c. Address: 625 N. Broadway Knoxville TN
d. Address: 625 N. Broadway Knoxville TN
e. Phone No.:
f. Phone No.:
If owner of the generating facility differs from the generator, provide:
g. Owner's Name:
Owner's Phone No.:

l. WCI WASTE CODE: IM 050

Containers

j. Description of Waste: TSI Friable

k. Quantity: 30 Units: No.: TYPE: BA

TYPE
DM - METAL DRUM
DP - PLASTIC DRUM
B - BAG
BA - 6 MIL PLASTIC BAG OR WRAP
T - TRUCK
O - OTHER

UNITS
P - POUNDS
Y - YARDS
M^3 - CUBIC METERS
Y^3 - CUBIC YARDS
O - OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Mike Robinson — Generator Authorized Agent Name
Signature
12/27/17 — Shipment Date

Section II TRANSPORTER (Generator complete a-d; Transporter I complete e-g; Transporter II complete h-n)

TRANSPORTER I

a. Name: NEO Corporation
b. Address: 289 Silkwood Dr Canton NC
c. Driver Name / Title: Mike Robinson (Supervisor)
d. Phone No.: 865-776-6885
e. Truck No.: P/U 465
f. Vehicle License No. / State: NC
Acknowledgement of Receipt of Materials.
g. Driver's Signature
12/27/17 — Shipment Date

TRANSPORTER II

h. Name: Waste Connections
i. Address: Chipman St Knoxville, TN
j. Driver Name / Title: Derek Bays
k. Phone No.:
l. Truck No.: 465
m. Vehicle License No. / State:
Acknowledgement of Receipt of Materials.
n. Driver's Signature
12/28/17 — Shipment Date

Section III DESTINATION (Generator complete a-d, destination site completes e-f.)

a. Site Name:
b. Physical Address:
c. Phone No.:
d. Mailing Address:
e. Discrepancy Indication Space:
I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.
f. Name of Authorized Agent
Signature
12/28/17 — Receipt Date

Section IV ASBESTOS (Generator completes a-d, f, g; Operator * completes e.)

a. Operator's * Name: NEO Corporation
b. Operator's * Phone No.: 865-776-6885
c. Operator's * Address: 289 Silkwood Dr Canton NC
d. Special handling instructions and additional information:

OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations

e. Operator's Name & Title: Mike Robinson (Supervisor) — Print / Type
Operator's * Signature
12/27/17 — Date

f. Name & address of Responsible Agency:

g. ☑ Friable; ☐ Non-friable; ☐ Both ____ % friable 100 % nonfriable ____

* Operator refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

DESTINATION RETAIN

NON-HAZARDOUS SPECIAL WASTE & ASBESTOS MANIFEST

No. 065295

If waste is asbestos waste, complete Sections I, II, III and IV.
If waste is NOT asbestos waste, complete only Sections I, II and III.

Section I GENERATOR (Generator complete all of Section 1)

a. Generator Name: Stme City of Knoxville
c. Address: 625 N Broadway Knoxville Tn
e. Phone No.:

b. Generating Location: City of Knoxville
d. Address: 625 N. Broadway Knoxville Tn
f. Phone No.:

If owner of the generating facility differs from the generator, provide:
g. Owner's Name:
Owner's Phone No.:

I. WCI WASTE CODE:
Containers:
j. Description of Waste: TSI Friable
k. Quantity: 30Y Units: No.: TYPE: BA

TYPE
DM - METAL DRUM
DP - PLASTIC DRUM
B - BAG
BA - 6 MIL PLASTIC BAG OR WRAP
T - TRUCK
O - OTHER

UNITS
P - POUNDS
Y - YARDS
M^3 - CUBIC METERS
Y^3 - CUBIC YARDS
O - OTHER

GENERATOR'S CERTIFICATION: I hereby certify that the above named material is not a hazardous waste as defined by 40 CFR Part 261 or any applicable state law, has been properly described, classified and packaged, and is in proper condition for transportation according to applicable regulations. **AND, if the waste is a treatment residue of a previously restricted hazardous waste** subject to the Land Disposal Restrictions, I certify and warrant that the waste has been treated in accordance with the requirements of 40 CFR Part 268 and is no longer a hazardous waste as defined by 40 CFR Part 261.

Mike Robinson — Generator Authorized Agent Name (Print / Type)
Signature
Shipment Date: 12/28/17

Section II TRANSPORTER (Generator complete a-d; Transporter I complete e-g; Transporter II complete h-n)

TRANSPORTER I
a. Name: Neo Corporation
b. Address: 289 Silkwood Dr Canton N.C.
c. Driver Name / Title: Mike Robinson (Supervisor) (Print / Type)
d. Phone No.: 865-776-6885 e. Truck No.:
f. Vehicle License No. / State: NC
Acknowledgement of Receipt of Materials.
g. Driver's Signature
Shipment Date: 12/28/17

TRANSPORTER II
h. Name: Waste Connections
i. Address: Chipman St Knoxville, TN
j. Driver Name / Title: Derek Bays (PRINT / TYPE)
k. Phone No.:
l. Truck No.: 465
m. Vehicle License No. / State: TN 08683
Acknowledgement of Receipt of Materials.
n. Driver's Signature
Shipment Date: 12/28/17

Section III DESTINATION (Generator complete a-d, destination site completes e-f.)

a. Site Name: MRL
b. Physical Address: 3300 Rd Memphis TN 38203
c. Phone No.: 745-6396
d. Mailing Address:
e. Discrepancy Indication Space:
I hereby certify that the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.
f. Name of Authorized Agent
Signature
Receipt Date: 12/28/17

Section IV ASBESTOS (Generator completes a-d, f, g; Operator * completes e.)

a. Operator's * Name: Neo Corporation
b. Operator's * Phone No.:
c. Operator's * Address: 289 Silkwood Dr Canton NC
d. Special handling instructions and additional information:

OPERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and government regulations.

e. Operator's Name & Title: Mike Robinson (Supervisor) (Print / Type)
Operator's * Signature
Date: 12/28/17

f. Name & address of Responsible Agency:

g. ☑ Friable; ☐ Non-friable; ☐ Both ____ % friable 100 % nonfriable ____

* Operator refers to the company which owns, leases, operates, controls, or supervises the facility being demolished or renovated, or the demolition or renovation operation, or both.

DESTINATION RETAIN

S&ME Inc. – City of Knoxville
Knoxville, TN

Asbestos Abatement Final Submittal

Contents

NEO CORPORATION

NEO Corporation Certificate of Asbestos Removal

NEO Corporation abated approximately 895 LF of TSI, 1,665 SF of Floor Tile/Mastic, 800 SF of Ceiling Cork Board, and 400 SF of Boiler Wrap at the City Laundry Building at 625 North Broadway Road in Knoxville, Tennessee. NEO Corporation utilized negative pressure, wet glove bag methods, HEPA vacuum, and a prompt clean up. NEO performed a final inspection of the jobsite upon completion, and fine cleaning was performed after the asbestos abatement. All waste was double-bagged and disposed of in an approved landfill for asbestos-containing materials.

All asbestos was removed according to local, state, and federal regulations.

Should you have any questions or require additional information, please contact me at 865-250-9454.

Sincerely,

Neo Corporation

Steve Steele – TN Division Manager

File: 7-30043-07

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237
Telephone: 800.347.4010

Asbestos Bulk Analysis Report

Report Number: 18-01-00172

Client: S&ME Inc. - Louisville
1413 Topside Road
Louisville, TN 37777

Received Date: 01/03/2018
Analyzed Date: 01/03/2018
Reported Date: 01/03/2018

Project/Test Address: Former Sanitary Laundry / 625 N Broadway; Knoxville, TN

Client Number:
44-3087

Fax Number:
865-970-2312

Laboratory Results

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials
18-01-00172-001	SL-028A		Black Tar-Like; White Brittle; Silver Paint-Like; Beige Granular; Brown Cork-Like; Inhomogeneous	NAD	5% Cellulose 95% Non-Fibrous
18-01-00172-002	SL-028B		Black Tar-Like; White Brittle; Silver Paint-Like; Beige Granular; Brown Cork-Like; Inhomogeneous	NAD	5% Cellulose 95% Non-Fibrous

Environmental Hazards Services, L.L.C

Client Number: 44-3087 **Report Number:** 18-01-00172

Project/Test Address: Former Sanitary Laundry / 625 N Broadway; Knoxville, TN

Lab Sample Number	Client Sample Number	Layer Type	Lab Gross Description	Asbestos	Other Materials

QC Sample: 26-M22010-1

QC Blank: SRM 1866 Fiberglass

Reporting Limit: 1% Asbestos

Method: EPA Method 600/R-93/116, EPA Method 600/M4-82-020

Analyst: Keleigh King

Reviewed By Authorized Signatory: Tasha Eaddy

Tasha Eaddy
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Each distinct component in an inhomogeneous sample was analyzed separately and reported as a composite. Results represent the analysis of samples submitted by the client. Sample location, description, area, volume, etc., was provided by the client. This report cannot be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without the written consent of the Environmental Hazards Service, L.L.C. California Certification #2319 NY ELAP #11714 NVLAP #101882-0 VELAP 460172. All information concerning sampling location, date, and time can be found on Chain-of-Custody. Environmental Hazards Services, L.L.C. does not perform any sample collection.

Environmental Hazards Services, L.L.C. recommends reanalysis by point count (for more accurate quantification) or Transmission Electron Microscopy (TEM), (for enhanced detection capabilities) for materials regulated by EPA NESHAP (National Emission Standards for Hazardous Air Pollutants) and found to contain less than ten percent (<10%) asbestos by polarized light microscopy (PLM). Both services are available for an additional fee.

400 Point Count Analysis, where noted, performed per EPA Method 600/R-93/116 with a Reporting Limit of 0.25%.

* All California samples analyzed by Polarized Light Microscopy, EPA Method 600/M4-82-020, Dec. 1982.

LEGEND: NAD = no asbestos detected

2 PLM

Asbestos Chain-of-Custody

18-01-00172

Due Date:
01/03/2018
(Wednesday)
AE M Inv

KEK

Environmental Hazards Services, LLC

www.leadlab.com
(800)347-4010
(804)275-4907 (fax)

7469 Whitepine Rd
Richmond, VA
23237

Company Name: S&ME, Inc. Address: 1413 Topside Road City/State/Zip: Louisville, TN 37777

Phone: (865) 970-0003 Fax: (865) 970-2312 E-mail: ebuckingham@smeinc.com Acct. Number: 44-3087

Project Name / Testing Address: Former Sanitary Laundry/ 625 N. Broadway **City/State (Required):** Knoxville, TN

Collected by: Emmy Buckingham Purchase Order Number: 4143-17-016

Turn Around Times : ***If no TAT is specified, sample(s) will be processed and charged as 3-day TAT.***

_____ 1 - Day _____ 2 - Day _____ 3 - Day ✓ Same Day (Must Call Ahead) _____ Weekend (Must Call Ahead)

No.	Client Sample ID	Date Collected	ASBESTOS							AIR					COMMENTS
			PLM	PLM Point Count 400	PLM Point Count 1000	PLM NY Protocol	PCM	TEM Chatfield (Bulk)	TEM AHERA (Air)	Time On	Time Off	Flow Rate (L/min)	Total Time (minutes)	Volume (Total Liters)	
1	SL-028A	1/2/2018	✓												Positive Stop
2	SL-028B	1/2/2018	✓												
3															
4															
5															
6															
7															
8															
9															
10															

Released by: Emmy Buckingham	Signature: Emmy Buckingham	Date/Time: 1/2/2018 -- 16:00
Received by: JNicolella	Signature: JNicolella	Date/Time: 1/3/18 1116a

Appendix V- Drum Disposal Documentation

03014

SHIPPING DOCUMENT
FOR NONHAZARDOUS MATERIAL

• TO BE COMPLETED BY GENERATOR •

Generator Name: Sanitary Laundry Date: 5/11/18

Address: 625 N Broadway St Phone # (____) ____ - ____

Knoxville Tn

DESCRIPTION OF WASTE / MUST CHECK ONE

UST/Gasoline____ UST/Diesel Fuel____ UST/Gasoline, Diesel and Waste Oil Mix____

UST/Waste Oil____ Spill/Gasoline____ Spill/Diesel Fuel____ Spill Waste Oil____

Water/Gas ____ Water/FuelOil ____

Other/Define 3 Solids

This shipment needs to be sampled at Domermuth's Facility ____Yes X No

Quantity (# of tons, drums or gallons)____ Containers (Dump Trucks, Drums or Vac Truck) ____

I hereby certify the above named material is a non-hazardous waste as defined by 40 CFR part 261 or any applicable law, has been properly described, classified & packaged, and is in proper condition for transportation according to applicalbe regulations.

Generator's Signature _____ Date 5/11/18 Time 16:26

(or authorized agent)

• TO BE COMPLETED BY TRANSPORTER •

Transporter Name: DES Vehicle Lic. # ____

Address Rutledge Pk Truck # ____

Knoxville Tn State of Registration ____

I hereby certify the above named material was picked up at the generator site listed above. I hereby certify the above named material was delivered without incident to destination listed below.

Driver's Name (Please Print) GARY GEORGE Date 5/11/18

Signature _____ Time ____

• TO BE COMPLETED BY FACILITY •

Please check one.

☑ **Domermuth Environmental Svcs.**
7826 Rutledge Pike
Knoxville, TN 37924
Phone # (865) 689-1332

☐ **Domermuth Environmental Svcs.**
#1 Mill Pond Rd.
Stearns, Kentucky 42647
Phone # (865) 689-1332

I hereby certify the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Signature _____ Date 5/11/18 Time ____

White & Yellow Copy - TSD Facility Pink Copy - Generator Gold Copy - Transporter

Spectra

P.O. Box 5898, Maryville, TN 37802-5898
SpectraTN@aol.com
865-970-2160
Fax 970-2074

WASTE PROFILE FORM

ACCT. #.: _____

A. SHIPPING ADDRESS:

Generator Name: Former Sanitary Laundry Facility
Street: 625 NORTH BROADWAY
City: KNOXVILLE State: TN Zip: 37917
Technical Contact: HEATHER WILLIAMS
Phone: 865-679-4372 Fax: _____
E-Mail Address: H.WILLIAMS.EAC@GMAIL.COM S.I.C. Code: KNX 1969-0813

☐ Check if you are Conditionally Exempt Small Quantity Generator EPA #: _____

Common Name of Waste: UNUSED ABSORBENTS
Original Process Generating Waste (must be specific): CLEAN UP

Is this waste being imported into the U.S.? ☐ Yes ☐ NO

Method of Shipment ☒ Drum (size) 55 ☐ Bulk) _____ Quantity) 8 per ☐ Mo ☐ Yr ☒ Onetime

MSDS Attached? ☐ Yes ☒ NO TCLP Attached? ☒ Yes ☐ NO ☐ Check if sample has been submitted

Generator's Authorization to Spectra (optional)

We do hereby authorize Spectra Services Inc.'s representative to transfer this information to forms of other facilities in order to negotiate and transport for proper disposal including alternative facilities. Spectra may make any necessary corrections to paper work. They may sign as "AGENT For the Generator" on profiles, manifest and land ban or make necessary corrections.

x Heather Williams (Per S&ME)
signature

B. PHYSICAL PROPERTIES @ 25 C (77 F)

Color (s): VARIES % Total Halogens: 0 Specific Gravity: .85-.9

Odor (via casual detection) ☒ None ☐ Mild ☐ Strong

Physical State: _____% Liquid _____% Sludge 100 %Solid _____% Powder

Phase/Layers: ☐ Single Layer ☐ Multiple, how many _____

Btu/Lb.	pH	Flashpoint
☒ < 5,000	☐ < 2.0	☐ <73
☐ 5-10,000	☒ 2.1-12.4	☐ 73-140
☐ > 10,000	☐ >12.5	☐ 140-200
Exact _____	Exact _____	☒ >200
		Exact _____

C. CHEMICAL COMPOSITION
(List Hazardous as well as Non-Hazardous components and corresponding ranges.)

ABSORBENT	100	%
	-	%
	-	%
	-	%
	-	%
	-	%

Total of maximum concentration must be ≥ 100%

HAZARDOUS PROPERTIES

☒ NONE ☐ BENZENE NESHAPE
☐ WATER REACTIVE ☐ AIR REACTIVE ☐ EXPLOSIVE
☐ SHOCK SENSITIVE ☐ PYROPHORIC ☐ POLYMERIZABLE
☐ RADIOACTIVE ☐ PESTICIDE INSECTICIDE ☐ PATHOGEN
☐ CORROSIVE ☐ ETIOLOGICAL ☐ BIOLOGICAL
☐ DIOXINS
OTHER

E. RCRA characterization

1. Is this material a "Hazardous Waste" under 40CFR 261.3? ☐ Yes ☒ No
2. Is this a "Characteristic Waste"? ☐ Yes ☒ No
   If "Yes" is it: ☐ D001 Ignitable ☐ D002 Corrosive ☐ D003 Reactive
   ☐ D004 - D043 Toxic, give specific codes: _____
3. Is this an "F" or a "K" waste or mixed with one? ☐ Yes ☒ No
   If "Yes" give waste codes from 40CFR 261.31 and/or 261.32: _____
4. Is this a commercial chemical product or spill cleanup that would carry a "U" or "P" waste code udner 40CFR 261.33 (e) or (f) ☐ Yes ☒ No
   If "Yes" give the waste code: _____
5. If used oil, do halogens exceed 1000 ppm? ☐ Yes ☐ No
   If "Yes" has it been mixed with hazardous waste? ☐ Yes ☐ No

DOT CHARACTERIZATION

1. Is this a "Hazardous Substance/Marine Pollutant" as defined in 49CFR D.O.T.? ☐ Yes ☒ No
2. If "Yes" give the porper D.O.T. Shipping Description form 49CFR 172.101: _____ UN/NA #: _____
3. Hazard Class: _____ RQ _____ Packaging Group: _____
4. Give the two primary hazardoud constituents: _____
5. RQ levels:

GENERATOR CERTIFICATION

I hereby certify that the above and attached description is complete and accurate to the best of my knowledge and ability. No deliberate or willful omissions of composition or properties exist and that all known or suspected hazards have been disclosed. I accept responsibility for any misinformation.

NAME (Print) Heather Williams TITLE Waste Coordinator
SIGNATURE Heather Williams DATE 9/3/2019

D.
Based on knowledge or analysis, provide an actual value or value for TCLP concentrations or total metal concentrations in ppm.

INORGANIC CHARACTERISTICS

D004	Arsenic	5.0	BRL
D005	Barium	100.0	
D006	Cadmium	1.0	
D007	Chromium	5.0	
D008	Lead	5.0	
D009	Mercury	0.2	
D010	Selenium	1.0	
D011	Silver	5.0	
	Copper	100.0	
	Zinc	500.0	BRL

ORGANIC CHARACTERISTICS

D012	Endrin	0.02	0
D013	Lindane	0.4	
D014	Methoxychlor	10.0	
D015	Toxaphene	0.5	
D016	2,4 -Dichlorophenoxyacetic Acid	10.0	
D017	2,4,5,-TP (Silvex)	1.0	
D018	Benzene	0.5	
D019	Carbon Tetrachloride	0.5	
D020	Chlordane	0.03	
D021	Chlorobenzene	100.0	
D022	Chloroform	6.0	
D023	o-Cresol	200.0	
D024	m-Cresol	200.0	
D025	p-Cresol	200.0	
D026	Cresol	200.0	
D027	1,4 -Dichlorobenzene	7.5	
D028	1,2-Odichloroethane	0.5	
D029	1,2-Dichloroethylene	0.7	
D030	12,4-Dinitrotolune	0.13	
D031	Heptachlor (and it's epoxide)	0.008	
D032	Hexachlorobenzene	0.13	
D033	Hexachlorobutadiene	0.5	
D034	Hexachloroethane	3.0	
D035	Methyl Ethyl Ketone	200.0	
D036	Nitrobenzene	2.0	
D037	Pentachlorophenol	100.0	
D038	Pyridine	5.0	
D039	Tetrachloroethylene	0.7	
D040	Trichloroethylene	0.5	
D041	2,4,5-Trichlorphenol	400.0	
D042	2,4,6-Trichlorophenol	2.0	
D043	Vinyl Chloride	0.2	0

OTHER COMPONENTS TOTAL (PPM)

	NO	YES		NO	YES
CYANIDES	☒	☐ ___			
SULFIDES	☒	☐ ___	AMINES	☒	☐ ___
REACTIVE CYANIDES	☒	☐ ___	PCB'S	☒	☐ ___
REACTIVE SULFIDES	☒	☐ ___	PHENOLICS	☒	☐ ___

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	1	865-679-4372	D KNX1969-0813-01

5. Generator's Name and Mailing Address: Former Sanitary Laundry Facility, 625 North Broadway, Tennessee

Generator's Site Address (if different than mailing address): SAME

Generator's Phone:

6. Transporter 1 Company Name: Environmental Remediation Consultants — U.S. EPA ID Number:

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: Environmental Remediation Consultants, 506 Hutchenson Rd, Seymour, TN 37865 — U.S. EPA ID Number:

Facility's Phone:

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Unused Absorbants	08	Dm	440	G	
2.						
3.						
4.						

13. Special Handling Instructions and Additional Information

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Heather Williams (Per S+ME) — Signature: Heather Williams — Month: 8 — Day: 14 — Year: 19

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Rusty Conard — Signature: — Month: 8 — Day: 14 — Year: 19

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Heather Williams — Signature: Heather Williams — Month: 8 — Day: 14 — Year: 19

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

04239

SHIPPING DOCUMENT
FOR NONHAZARDOUS MATERIAL

• TO BE COMPLETED BY GENERATOR •

Generator Name: Sanitary Laundry Date: 9-11-19

Address: 625 N Broadway Phone # (_____) _____ - _____

Knoxville, TN

DESCRIPTION OF WASTE / MUST CHECK ONE

UST/Gasoline_____ UST/Diesel Fuel_____ UST/Gasoline, Diesel and Waste Oil Mix_____

UST/Waste Oil_____ Spill/Gasoline_____ Spill/Diesel Fuel_____ Spill Waste Oil_____

Water/Gas _____ Water/FuelOil_____

Other/Define 3 soil

This shipment needs to be sampled at Domermuth's Facility _____Yes X No

Quantity (# of tons, drums or gallons) 3 Containers (Dump Trucks, Drums or Vac Truck) _____

I hereby certify the above named material is a non-hazardous waste as defined by 40 CFR part 261 or any applicable law, has been properly described, classified & packaged, and is in proper condition for transportation according to applicalbe regulations.

Generator's Signature _____ Date 9/11/19 Time 1450

(or authorized agent)

• TO BE COMPLETED BY TRANSPORTER •

Transporter Name: Domermuth Environmental Vehicle Lic. # Rental

Address 5915 Rutledge Pk Truck # _____

Knoxville TN 37924 State of Registration _____

I hereby certify the above named material was picked up at the generator site listed above. I hereby certify the above named material was delivered without incident to destination listed below.

Driver's Name (Please Print) Dale Cooper Date 9-12-19

Signature _____ Time 2:50 pm

• TO BE COMPLETED BY FACILITY •

Please check one.

☒ **Domermuth Environmental Svcs.**
7826 Old Rutledge Pike
Knoxville, TN 37924
Phone # (865) 689-1332

☐ **Domermuth Environmental Svcs.**
3041 S. Hwy. #1651
Stearns, Kentucky 42647
Phone # (865) 689-1332

I hereby certify the above named material has been accepted and to the best of my knowledge the foregoing is true and accurate.

Signature _____ Date 9-11-19 Time 4:00

White & Yellow Copy - TSD Facility Pink Copy - Generator Gold Copy - Transporter

Date: 1/14/2019

Photographer: Nathan Peterson

1	**Location / Orientation**	Northeast portion of basement
	Remarks	View of five of the six drums containing granular material.

Date: 1/14/2019

Photographer: Nathan Peterson

2	**Location / Orientation**	Northeast portion of basement
	Remarks	View of six drums containing granular material.

Date: 1/14/2019

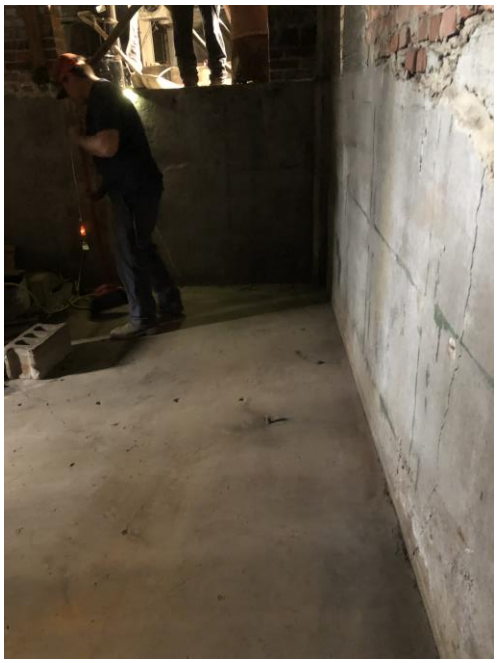
Photographer: Nathan Peterson

3	**Location / Orientation**	Northeast portion of basement
	Remarks	View of granular material.

Date: 1/14/2019

Photographer: Nathan Peterson

4	**Location / Orientation**	Northeast portion of basement
	Remarks	Former location of granular material drums following removal and cleanup.



Date: 1/14/2019

Photographer: Nathan Peterson

5	**Location / Orientation**	Northeast portion of basement – following drum removal and cleanup.

Date: 1/14/2019

Photographer: Nathan Peterson

6	**Location / Orientation**	Central portion of basement
	Remarks	Eight drums filled with granular material for disposal.